The Role of Autobiographical Memory Deficits in the Experiential Negative Symptoms of Psychosis

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Systematic Literature Review

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Main Research Project

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Systematic Literature Review:

Is there a relationship between depressive symptoms and negative symptoms in people with non-affective psychosis?

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Contents

Table of Tables

Table of Figures

Abstract

The negative symptoms of psychosis and depressive symptomatology share several features e.g. low motivation, apathy and reduced activity. Understanding the links between these two sets of symptoms will inform the development of future interventions targeting these difficulties in people with psychosis. The aim of this systematic review and meta-analysis is to quantify the relationship between these two clusters of symptoms, as measured in studies to date. Further analyses investigate potential moderating variables. PsycInfo, Embase and Medline were systematically searched to identify eligible studies. Inclusion criteria measured both depression and negative symptoms using validated measures in a sample with non-affective psychosis diagnoses. 2020 records were initially screened and 56 were included in the meta-analysis and review. Both meta-analyses and meta-regressions were conducted to explore the main effect and potential moderating variables. The findings showed a significant but small relationship between negative and depressive symptoms (Effect Size = 0.19). This did not vary greatly with the measures used and was not moderated by demographic variables or quality ratings. Depression and negative symptom severity showed an inverse reciprocal relationship. Heterogeneity was high across these analyses. The findings show that there is a relationship between depression and negative symptoms in people with psychosis. This is taken as support for the dimensional approach to understanding symptoms in this population.

Introduction

The negative symptoms of psychosis include low motivation, anhedonia, alogia, social withdrawal and blunted affect (Kirkpatrick, Fenton, Carpenter, & Marder, 2006). Research has shown that these symptoms have a significant impact on functioning (Menendez-Miranda et al., 2015; Robertson et al., 2014; Rocca et al., 2014), with some studies suggesting these difficulties are a bigger barrier to recovery than positive or cognitive symptoms (Berenbaum, Kerns, Vernon, & Gomez, 2008; Marchesi et al., 2015). Negative symptoms were initially conceptualised as primary, a core feature of the illness, or secondary – present due to other factors such as substance misuse, medication side-effects, depression or as a response to the positive symptoms (Peralta, Cuesta Mj Fau - Martinez-Larrea, Martinez-Larrea A Fau - Serrano, & Serrano, 2000). However this distinction has been found to have limited clinical reliability and utility (Kirschner 2016; Peralta 2000) and more recent research has focused on a distinction within negative symptoms – experiential vs. expressive (Messinger et al., 2011). Experiential symptoms include low motivation, anhedonia and withdrawal whereas expressive symptoms are identified as blunted affect and alogia. Depression also includes a range of symptoms with similarities to negative symptoms, and the following are highlighted as key in the diagnostic criteria: loss of pleasure (anhedonia), low motivation and low mood (American Psychiatric Association, 2013). A narrative review of the literature concluded that depressive symptoms are very common in people with schizophrenia and perhaps up to 50% of people with this diagnosis would also meet criteria for depression (Buckley, Miller, Lehrer, & Castle, 2009; Siris, 2003). This review by Buckley et al. (2009) also found that co-morbid depressive symptoms worsen the prognosis for people with a diagnosis of schizophrenia.

One conceptualisation of these difficulties is that depression is a separate disorder co-morbid with psychosis, including negative symptoms. The underlying idea behind this is that both depressive and negative symptoms are driven by different organic processes (Malaspina et al., 2014). Some attempt has also been made to identify people for whom low mood is a significant problem alongside psychosis and this has resulted in diagnoses such as "schizoaffective disorder", "depression with psychotic features" and also applies of course to bipolar disorder. The usefulness of these diagnostic labels in clinical practice, particularly schizoaffective disorder, is still debated in the field (Siris, 2003). Kirschner, Aleman, and Kaiser (2016) concluded in their narrative review that the presence of depressive symptoms in someone with psychosis may be missed because of the lack of clarity regarding how to reliably assess them. This may negatively impact on their treatment options as evidence-based treatments for depression are not offered to these individuals. It could also be argued that the conceptualisation of these difficulties as organically-driven has limited the development of psychological models and treatments in this field.

Alternative conceptualisations of depressive symptoms are either as one dimension of negative symptoms or as part of the wider psychosis spectrum, driven by psychological processes as described in a review by Sarkar, Hillner, and Velligan (2015). Indeed, psychological models of psychosis e.g. Garety, Kuipers, Fowler, Freeman, and Bebbington (2001) have proposed a direct route from emotional changes to experiences of psychotic symptoms. The phenomenological overlap between negative and depressive symptoms is more apparent with *experiential* negative symptoms which include low motivation and anhedonia, commonly seen in depression (American Psychiatric Association, 2013).Newer measures of negative symptoms

include specific subscales of experiential symptoms and there is some evidence that they show good divergent validity from depressive measures (Forbes et al., 2010; Llerena et al., 2013). This has been achieved by focusing on low motivation across several areas of functioning (social, employment, hobbies) rather than using terms such as “low energy” or “low mood” which can measure depressive symptoms. Experiential subscales do not assess cognitive symptoms and there is some indication in the literature that this may be where distinctions can also be drawn from depressive symptoms although findings are mixed (Kirkpatrick, 2014). Hopelessness, guilt and suicidal ideation are reliably indicated as important cognitions in depression, whereas self-defeatist beliefs appear to play a role in negative symptoms and have been incorporated into the cognitive model of negative symptoms developed by Grant and Beck (2009). Thus, the areas of overlap between negative and depressive symptoms and the psychological processes that may underlie these are still unclear, limiting the ability to develop targeted treatments for these difficulties.

The evidence regarding the overlap between these symptoms has been mixed with some studies finding an association between depressive symptoms and negative symptoms and others reporting none (Amr & Volpe, 2013; Blanchard, Horan, & Brown, 2001; Edwards, Cella, Tarrier, & Wykes, 2015a; Pelizza & Ferrari, 2009). This variation in findings may be due to the range of measures used to assess both depression and negative symptoms in people with psychosis. In a systematic review which examined the psychometric properties of measures of depression in schizophrenia, Lako et al. (2012) concluded that the Calgary Depression Scale for Schizophrenia (CDSS) has the best divergent validity in that it reliably distinguishes depressive symptoms from negative symptoms. Lako et al. (2012) propose that this difference is because the CDSS was developed with the non-affective psychosis population in mind e.g. “lack of

interest" was excluded because it is a feature of both negative symptoms and depression. However, this deliberate goal of minimising overlap might lead to poor identification of certain valid experiences. The performance of other negative symptoms measures in terms of divergent validity from depression measures, or identifying areas of overlap, is not clear among these mixed findings. A recent systematic review (Krynicki, Upthegrove, Deakin, & Barnes, 2018) considered the relationship between depressive and negative symptoms in people with a diagnosis of schizophrenia and concluded that the symptom domains of pessimism, low mood and suicidal ideation may be specific to depression, while alogia and blunted affect are specific to negative symptoms. However, they also concluded the domains of anhedonia, avolition and anergia may be common to both and used this to suggest a dimensional model of negative, positive and depressive symptoms. Since this model is based on narrative evidence and the findings regarding these proposed relationships are mixed, a quantitative synthesis of the evidence would be valuable to develop our understanding further.

The time is therefore ripe for a systematic meta-analysis of this field to progress both the assessment and treatment of negative and depressive symptoms in psychosis. This method improves on previous systematic reviews by quantifying this relationship and will include studies which have assessed both negative and depressive symptoms. Finally, this meta-analysis was the first to look at the sub-domains of negative symptoms which are reflected in newer measures and may help clarify the process of assessment for clinicians. If it is shown that there is a significant relationship, then this may suggest new conceptualisations and approaches for this clinical group.

The following research questions were addressed in this review and meta-analysis:

1. Is there a relationship between negative symptoms and depression in people with psychosis?
2. Does this relationship vary according to depression or negative symptom measures or subscales used?
3. Is this relationship moderated by depressive or negative symptom severity?
4. Is this relationship moderated by the diagnosis of the sample, quality of the study or demographic factors?

Method

Inclusion criteria

Studies were included if they (i) include a population with at least one of the diagnoses in the group of non-affective psychotic disorders (ii) include a validated measure of negative symptoms in psychosis (iii) include a validated measure of depression in psychosis (iv) have been published in a peer-reviewed publication (v) have been written in English. Studies were included if the results reported a test of a direct association between the negative symptom measure and depression measure regardless of whether this was the primary outcome of the study.

Exclusion criteria

Studies were excluded if they were (i) conference abstracts (ii) book chapters (iii) theoretical or review articles (iv) qualitative data only was presented or (v) they were single case studies or dissertations. Studies were also excluded if the sample included people with a diagnosis of bipolar affective disorder or depression with psychotic features as low mood is

primary in these diagnoses. Studies were excluded if they removed people who met criteria for depression from their sample as we wished to analyse the relationship at all levels of depressive symptoms. Studies which only used a single item to assess depressive symptoms were excluded as this was not considered robust enough. Negative symptoms were also often assessed using the same scale e.g. Positive and Negative Syndrome Scale (PANSS) which included this single depression item raising concerns about co-variance. Studies were also excluded if insufficient statistical information was provided for the paper to be included in the analyses e.g. only associations for change scores presented or authors did not respond to request for additional data (k = 3).

Literature search

PROSPERO was examined for reviews with an overlapping research question, none were identified. This review was then registered on the PROSPERO database (ID: CRD42017083440). Relevant studies were identified through the systematic search of the databases Medline, Embase and PsycINFO. These databases were selected to fully capture the range of journals in this field. The following search terms were used as heading or keyword searches: (SCHIZOPHREN* OR SCHIZOAFFECT OR PSYCHOSIS OR PSYCHOTIC) AND (NEGATIVE SYMPTOMS) AND (DEPRESS*). The use of search terms targeting specific depressive or negative symptoms (e.g. anergia, alogia, motivation) were considered but not included as the focus of this review is on the whole range of depressive and negative symptomatology and including individual symptoms may have biased the sample of papers identified. A recent narrative review (Krynicki et al., 2018) which did include individual symptoms returned a similar number of papers as the current review suggesting this strategy captured all relevant papers.

The current review followed the flow of information as suggested by the PRISMA statement (Moher, Liberati, Tetzlaff, & Altman, 2009). Following the initial search, duplicate records were removed, and the inclusion and exclusion criteria were applied.

Quality assessment

Studies were assessed using an adapted version of the Quality Assessment Tool for Quantitative Studies (Thomas, Dobbins, Fau, & Micucci, 2004); see Appendix for rating scale and instructions. The measure was adapted by removing sections C, D and G which were relevant for randomised controlled trials only and therefore not for the studies included in this meta-analysis. One additional item was added which assessed whether the analyses of negative and depressive symptoms was outlined in the design of the study or whether it was the result of secondary analyses. This was felt to be an important quality criterion in this group of studies. All studies were rated by CE and a sample of 10% (k = 6) were rated by an independent assessor. One of these six papers had a discrepancy greater than 2 between raters, this rating was discussed – it was specifically discrepant on the selection bias item only, and a consensus reached. The ratings were shown to have excellent reliability (Intraclass Correlation = .94, 95% CIs = .76 - .99).

Data extraction and analytic procedure

Based on the inclusion criteria, 56 studies were considered eligible for inclusion in the final meta-analyses. The following data were extracted from each study: sample size, age, gender, ethnicity, diagnosis (% schizoaffective disorder), mean scores on depression and negative symptoms measures, r statistic and p value for the correlation. To ensure each study

was weighted appropriately where multiple Pearson's r values were presented for different subscales these were combined for the main analysis. Individual subscales were reported in sub-group analyses. All scores were converted to Fisher's z scores to represent the continuous nature of the data and to minimise the risk of bias associated with Pearson's r (Borenstein, Hedges, Higgins, & Rothstein, 2009). All analyses were conducted in *Stata* (StataCorp, 2017) using the *metan* package for meta-analyses and *metareg* for meta-regressions. We hypothesised that the true effect sizes would vary with sample variations acting as moderating variables, and so random effect models were chosen for the meta-analyses of main effects as well as meta-regressions and subgroup analyses (Borenstein, Hedges, Higgins, & Rothstein, 2010). The main analysis was conducted to assess the relationship between depressive and negative symptoms and included all the studies. Sub-group analyses were conducted to examine this relationship when different measures were used. Meta-regression analyses were carried out to examine whether the severity of depressive or negative symptoms moderated the findings. Finally, meta-regression analyses were conducted to assess whether age, gender, ethnicity or diagnosis in the sample moderated the findings.

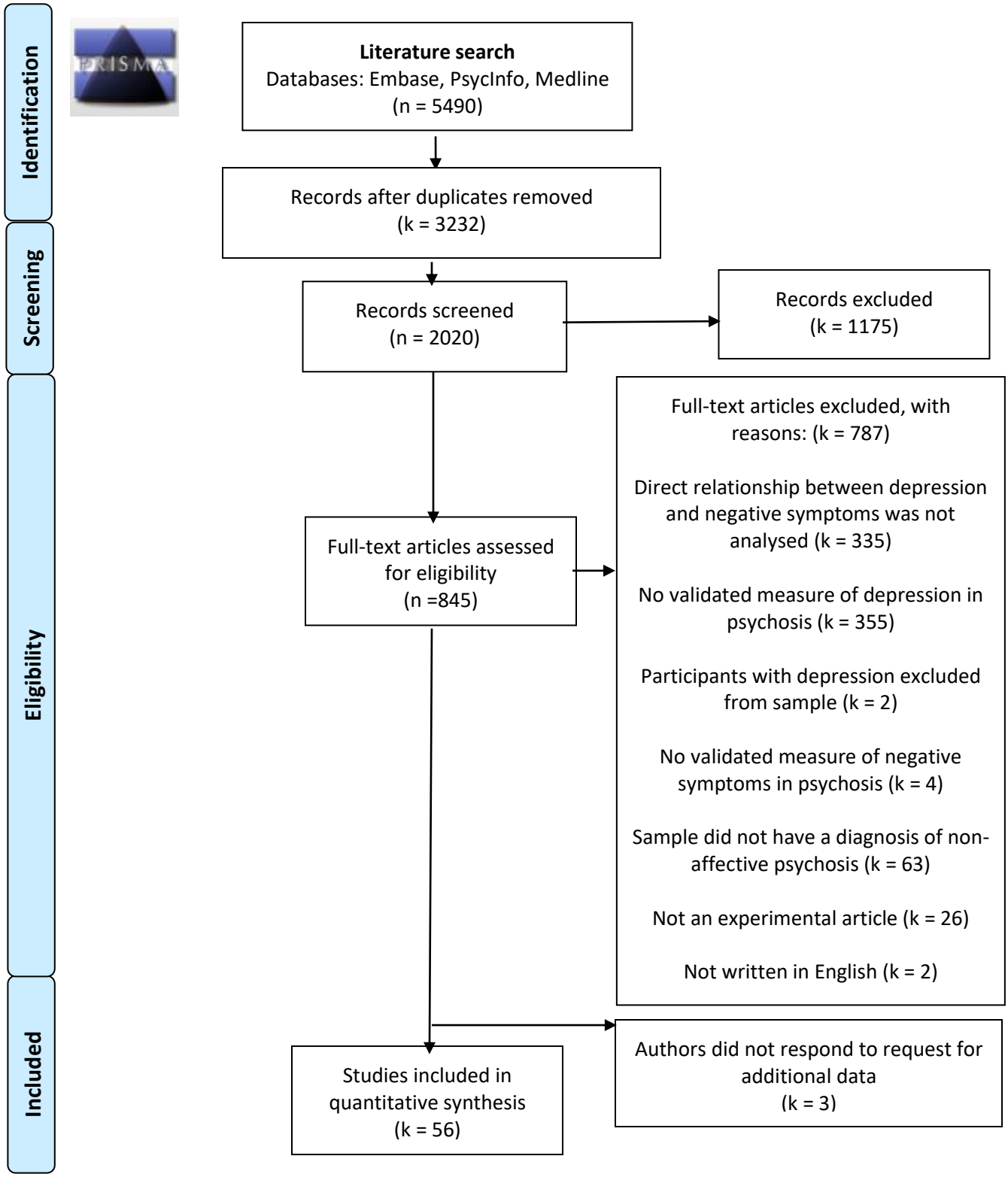
For all analyses, heterogeneity statistics (I^2 and τ^2) are reported to examine the amount of variance across studies. The I^2 statistic was included as it has greater power to detect true heterogeneity when analyses only include a small number of studies. The convention is to consider an I^2 statistic higher than 25%, 50% or 75% as representing low, moderate or high heterogeneity respectively. The τ^2 statistic measures the between-study variance in the meta-analyses and a value >1 is suggestive of very high heterogeneity (Deeks, Altman, & Bradburn, 2008). Rather than the 95% confidence interval, the more rigorous 95% prediction interval, which takes into account the heterogeneity and describes the range of values in which 95% of

effect sizes in future studies can be expected to fall, is reported for the main effect (Borenstein et al., 2009).

Publication and other biases can be introduced through the systematic review process and this can influence the findings when conducting a meta-analysis. Publication bias was assessed with a visual inspection of the funnel plots and using Egger's test for asymmetry (Egger, Smith, Schneider, & Minder, 1997). Begg's test was also conducted which makes fewer assumptions than Egger's test and has sufficient power to detect bias in a meta-analysis of this size (Begg & Mazumdar, 1994). All publication bias analyses were conducted using the *metabias* package in Stata.

Results

Figure 1: PRISMA flow diagram



Characteristics of studies

Fifty-six papers were included in the analyses, see PRISMA flow diagram in Figure 1. The included studies are summarised in Table 1 below. Based on the data available, there were 8,177 unique participants in these studies and 66.79% were male. The mean age reported for the samples ranged from 22.3 – 59.35 with a composite mean age of 37.16 (SD = 9.58). Two studies selected people aged over 40 years old for inclusion in their sample (Mausbach, Cardenas, Goldman, & Patterson, 2007; Zisook et al., 1999). However, two studies did not report mean age or gender for their samples (Addington, Addington, & Maticka-Tyndale, 1994; Chemerinski, Bowie, Anderson, & Harvey, 2008) and one further study did not report mean age (Norman, Manchanda, Harricharan, & Northcott, 2015). Only ten studies reported the ethnicity of the sample, with an average of 49.25% of participants in a BME category. This composite categorisation was compared to a composite category of "White" for the purposes of the meta-analysis to maximise power. Thirty-four of the studies included in the analyses only included people with a diagnosis of schizophrenia. Of the 23 studies that did include people with schizoaffective disorder, only 10 reported the percentage of their sample that had this diagnosis, with a mean of 16.12%. The majority of studies (k = 48) reported findings from community samples, two studies included mixed inpatient and outpatient participants and three studies included people solely from an inpatient setting. Three studies reported findings from participants experiencing their first or second episode of psychosis. It is relevant to note that 9 of the included studies were focused on the validation of a measure of negative symptoms, sometimes in translated form. The other 47 studies report on a variety of experimental and cross-sectional investigations.

Table 1: Table of Included Studies

Study	Authors & Publication Year	N	% Male	Mean Age (SD)	SZA Disorder Included (Y/N, %)	Depression Scale(s)	Depression Severity Mean (SD)	Negative Symptom Scale (s)	Negative Symptom Severity Mean (SD)	Correlation (r value)	P Value	Quality Score (0-15)
1	**Couture et al, 2011**	62	62.9	46.7 (8.4)	Y (39.5)	CDSS	2.85 (3.3)	CAINS	Expr= 5.6 (5.0) MAP = 23.8 (12.9)	Expr= -0.08 MAP = 0.11	>.05 >.05	11
2	**Grant et al, 2009**	55	65	36.9 (9.9)	Y (9)	BDI	13 (11.5)	SANS	23.7 (12.1)	.20	>.05	10
3	**Uzenoff et al, 2010**	41	58.5	22.3 (3.5)	Y	CDSS	3.78 (4.26)	PANSS Neg	28.07 (7.10)	0.07	>.05	10
4	**Grant et al, 2010**	123	65.8	38.6 (12.1)	Y (17.9)	BDI	17.1 (12.5)	SANS	27.2 (11.9)	0.18	<.05	10
5	**Roseman et al, 2008**	144	80.87	52.33 (.52)	Y (36.42)	CDSS	NR	PANSS Neg	NR	0.11	>.05	10
6	**Mausbach et al, 2007**	210	23	51.30 (7.54)	Y (19)	HAM-D	10.31 (7.26)	PANSS Neg	14.75 (4.74)	0.34	<.05	9
7	**Freeman et al, 2006**	187	72	37.5 (10.9)	Y (11)	BDI	21.6 (13.0)	PANSS Neg	21.0 (6.2)	.28	<.001	11
8	**Todarello et al, 2005**	29	75.9	39.1 (10.9)	Y	MADRS	21.9 (8.3)	PANSS Neg	28.4 (10.5)	0.25	>.05	10
9	**Fitzgerald et al, 2002**	309	64.1	34.05 (10.6)	Y	MADRS	14.6 (9.07)	PANSS Neg	19.55	.40	=.000	12
10	**Muller et al, 2002**	57	63	42.9 (11.8)	Y (7)	CDSS	9 (6.3)	PANSS Neg	18.4 (7.4)	.54	<.001	8
11	**Malla et al, 2002**	110	72	24.9 (7.8)	Y (7.3)	CDSS	3.3 (3.7)	SANS	10.2 (2.5)	Expr = 0.20 MAP = 0.42	>.05 <.001	13
12	**Brebion et al, 2001**	40	70	34.1 (11.1)	Y	HAM-D	8 (5.2)	SANS	8.4 (4.3)	0.34	<.05	10
13	**Peralta et al, 2000**	47	70	26.9 (9.1)	Y (4)	CDSS	2.4 (3.1)	SANS	6.6 (5.3)	0.01	<.05	9

14	**Wolthaus et al, 2000**	138	76.8	23.2 (5.26)	Y (10.1)	MADRS	NR	PANSS Neg	NR	0.51	<.001	12
15	**Zisook et al, 1999**	60	50	59.35 (10)	N	HAM-D	10.35 (5.73)	SANS BPRS Neg	8.39 (4.91) 5.27 (2.77)	0.33 0.19	0.01 0.15	10
16	**Peralta et al, 1999**	45	63.6	31.6 (12.8)	N	CDSS	3.6 (4.8)	PANSS-Neg	12.5 (5.8)	0.21	>.05	9
17	**Lancon et al, 2000**	95	62	33.9 (11.7)	N	CDSS MADRS HDRS	7.5 (5.1) 17.9 (9.1) 18.1 (6.5)	PANSS-Neg	24.7 (5.6)	-0.01 0.12 0.02	>.05 >.05 >.05	10
18	**Brebion et al, 2000**	40	70	34.1 (11.1)	N	HDRS	7.98 (5.17)	PANSS SANS	16.3 (6.7) 8.39 (4.32)	0.19 0.35	>.05 <.05	10
19	**Kontaxakis et al, 2000**	64	60.9	30.3 (8.9)	N	HDRS CDSS	18.11 (5.46) 5.67 (5.13)	PANSS-Neg	NR	0.19 0.09	>.05 >.05	9
20	**Baynes et al, 2000**	120	76	39 (9.95)	N	BDI HDRS	16.1(5.8) 12.65(6.7)	SANS	51.1(18.4)	0.11 0.35	>.05 <.001	13
21	**Kilzeih et al, 2003**	43	97.7	43.05 (7.05)	N	HDRS	6.84 (4.25)	SANS	62.23 (17.41)	.19	>.05	10
22	**Bottlender et al, 2003**	33	66.67	32.15 (9.12)	N	MADRS	18.3 (8.8)	SANS	55.5 (24.4)	0.15	.41	10
23	**Rocca et al, 2005**	78	59	36.13 (8.93)	N	CDSS	3.77(3.0)	PANSS - NEG	17.1 (9.52)	0.42	<.001	10
24	**Chemerinski et al, 2008**	230	NR	NR	N	BDI	11.5 (9.6)	PANSS-NEG	NR	0.14	.03	9
25	**Schennach-Wolff et al, 2011**	249	61	34.1 (11.09)	N	CDSS	6.97(2.49)	PANSS-NEG	19.07(7.13)	.29	NR	9
26	**Rabany et al, 2011**	240	73.3	36.99 (12.21)	N	CDSS	3.16 (3.61)	PANSS-NEG	27.38 (4.69)	- .184	.012	11
27	**Addington et al, 1994**	150	NR	NR	N	CDSS	4.1(4.28)	PANSS-NEG	20.15(4.84)	0.27	<.01	10
28	**McAdams et al, 1996**	101	77	58.5 (9.7)	N	HDRS	9.6 (6.1)	SANS	8.2 (4.8)	.50	<.05	10

29	**Addington et al, 1996**	89	60	35.3 (10.3)	N	CDSS HDRS	6.49 (3.31) NR	PANSS Neg	20.2 (9.6)	-.03 0.08	>.05 >.05	8
30	**Collins et al, 1996**	37	75.6	32.33 (8.81)	N	HDRS CDSS	NR	PANSS Neg	NR	0.453 0.228	<.005 >.05	9
31	**Nakaya et al, 1997**	89	45	31.19 (9.6)	N	HDRS	16.5 (7.3)	PANSS	23.9 (4.7)	0.20	>.05	13
32	**Collins et al, 1997**	58	77.6	34.10 (8.01)	N	CDSS	5.40 (4.32)	PANSS Neg	18.74 (7.37)	0.178	>.05	8
33	**Norman et al, 1998**	60	68.3	38.8	N	BDI HRSD	12.37 6.00	SANS	34.87	0.15 0.15	>.05 p>.05	10
34	**Haug et al, 2016**	55	51	25.2 (7.3)	Y	CDSS	9.1 (6.0)	PANSS Neg	14.1 (6.7)	-0.289	0.032	10
35	**Norman et al, 2015**	127	78.7	NR	Y	CDSS	NR	SANS	NR	Expr: .30 MAP: .37	<.01 <.01	10
36	**Fervaha et al, 2015**	62	67.7	26.3 (3.9)	N	CDSS	1.8 (2.7)	SANS	11.5 (6.7)	0.21	>.05	10
37	**Bozikas et al, 2016**	48	62.5	32.81 (7.74)	Y	CDSS	5.21 (4.26)	PANSS Neg	15.38 (6.76)	0.404	<.01	12
38	**Kjelby et al, 2015**	124	68.5	37.2 (13.1)	Y	CDSS	5.44 (4.8)	PANSS Neg	20.6 (7.95)	0.15	<.05	10
39	**Alessandrini et al, 2016**	271	70.8	36.1 (11.9)	N	CDSS	4.2 (4.4)	PANSS Neg	20 (8.0)	0.17	>.05	11
40	**Best et al, 2014**	136	73.5	56.08 (9.23)	Y	BDI	NR	PANSS Neg	NR	.21	.019	10
41	**DeRosse et al, 2014**	184	69.02	40.98 (11.07)	Y	HRSD	11.59 (7.65)	SANS	29.01 (12.54)	0.32	<.001	8
42	**Fervaha et al, 2014**	1427	74.2	40.6 (11.1)	N	CDSS	4.6 (4.4)	PANSS Neg	19.3 (6.7)	0.18	<.001	11
43	**Ricarte et al, 2014**	31	80.6	38.5 (10.6)	N	BDI	13.03 (8.39)	PANSS Neg	13.41 (3.83)	.15	>.05	9
44	**Rabany et al, 2013**	184	74.5	36.37 (12.58)	N	CDSS	3.17 (3.61)	PANSS Neg	27.30 (4.52)	-.189	.01	9

45	**Lin et al, 2013**	302	61.3	38.17 (9.48)	N	HDRS	5.89 (4.20)	SANS	50.42 (15.97)	.265	<.001	11
46	**Tapp et al, 2001**	104	65	30 (9)	N	HDRS	13.5 (4.14)	SANS	NR	.47	<.0001	10
47	**Roche et al, 2010**	67	70.1	25 (9.78)	N	CDSS	2.16 (3.07)	PANSS Neg	NR	.005	>.05	9
48	**Kring et al, 2013**	162	57	46.8 (9.5)	Y	CDSS	2.7 (3.0)	CAINS SANS BPRS Neg	NR	Expr:0.15 MAP: 0.13 0.25 0.05	>.05 >.05 <.01 >.05	11
49	**Llerena et al, 2013**	37	64.9	50.16 (5.12)	Y	CDSS	1.11 (1.88)	MAP-SR	NR	.13	>.05	10
50	**Kontaxakis et al, 2000b**	64	61	30.3 (8.9)	N	CDSS	5.67 (5.13)	PANSS Neg	20.22 (8.84)	0.123	>.05	10
51	**Sarro et al, 2004**	93	60.2	37.2 (10.4)	N	CDSS	4.1 (4.4)	PANSS Neg	19.8 (8.9)	0.239	<.01	10
52	**Polat Nazli et al, 2016**	65	76	34.6 (8.3)	N	CDSS	2.5 (3.8)	BNSS	29.4 (17.6)	-.013	.91	11
53	**Engel et al, 2016**	50	56	35.7 (10.36)	Y	BDI	16.37 (7.30)	MAP-SR	25.93 (10.39)	0.39	<.001	11
54	**Valiente-Gomez et al, 2015**	100	74	40.98 (12.5)	N	CDSS	3.12 (3.91)	CAINS-MAP CAINS – Expr CAINS Total	17.88 (8.69) 6.70 (3.60) 24.58 (11.1)	0.34 0.27 0.35	<.01 <.01 <.01	11
55	**Mucci et al, 2015**	912	69.8	40.1 (10.7)	N	CDSS	4.0 (4.0)	BNSS	NR	0.28	<.00001	11
56	**Kim et al, 2016**	139	54.7	38.9 (11.1)	N	CDSS	4.9 (4.9)	MAP-SR	NR	0.09	>.05	11

Quality Ratings of Studies

The quality ratings in each area are summarised for the studies in Table 2 below. Studies generally scored moderate – high in the selection bias section with the majority recruiting from a wide pool of participants. Studies scored lower in this area when they sampled from clinic, service or ward only or their recruitment procedure was not described clearly. The majority of studies stated hypotheses regarding the relationship between depression and negative symptoms and tested this appropriately – scoring the single mark available for this section. The use of valid and reliable measures was an inclusion criterion for the review and therefore all studies scored at least 2 in this scale. Studies did not consistently report subscales for the negative symptom measures used and this prevented them from achieving the full score in this section. The studies included in this meta-analysis were thorough in reporting missing data and accounting for this in analyses where appropriate, scores were therefore high in this section unless the study did not account for this. The studies included all conducted appropriate correlational analyses as this was a criterion for inclusion in the meta-analysis. The lower scores in this section are given to studies which do not account for multiple correlational analyses in their analysis or significance levels.

Table 2: Full Quality Ratings of Included Studies

Study	Selection Bias (0-3)	Study Design (0-1)	Data Collection Methods (0-3)	Missing Data (0-3)	Analyses (0-3)	Total (0-15)
1	2	1	3	3	2	11
2	2	1	2	3	2	10
3	2	1	2	3	2	10
4	2	1	2	3	2	10
5	2	1	2	3	2	10
6	2	1	2	3	1	9
7	3	1	2	3	2	11
8	3	1	2	3	1	10
9	2	1	3	3	3	12
10	1	0	2	3	2	8
11	3	1	3	3	3	13
12	2	1	3	2	2	10
13	1	1	2	3	2	9
14	2	1	3	3	3	12
15	2	1	2	2	3	10
16	1	1	2	3	2	9
17	2	1	2	3	2	10

18	2	1	3	2	2	10
19	1	1	2	3	2	9
20	3	1	3	3	3	13
21	1	1	2	3	3	10
22	1	1	2	3	3	10
23	1	1	2	3	3	10
24	1	1	2	3	2	9
25	3	1	2	1	2	9
26	2	1	3	3	2	11
27	2	1	2	3	2	10
28	2	1	2	3	2	10
29	1	1	2	2	2	8
30	1	1	2	3	2	9
31	4	1	2	3	3	13
32	1	0	2	3	2	8
33	2	1	2	3	2	10
34	2	1	2	3	2	10
35	1	1	3	3	2	10
36	1	1	3	3	2	10
37	4	1	2	3	2	12
38	2	1	2	3	2	10
39	2	1	2	3	3	11
40	1	1	3	3	2	10

41	1	0	2	3	2	8
42	3	1	2	3	2	11
43	1	1	2	3	2	9
44	2	1	2	2	2	9
45	2	1	2	3	3	11
46	1	1	2	3	3	10
47	3	1	2	1	2	9
48	2	1	3	3	2	11
49	1	1	3	3	2	10
50	1	1	2	3	3	10
51	1	1	2	3	3	10
52	2	1	3	3	2	11
53	2	1	2	3	3	11
54	2	1	3	3	2	11
55	2	1	2	3	3	11
56	2	1	3	3	2	11

Measures of negative symptoms

Four measures of negative symptoms were used in the studies included in the analysis; these are detailed in Table 1. The most commonly used assessment was the negative symptom subscale of the Positive and Negative Syndrome Scale (PANSS) (Kay, Fiszbein, & Opler, 1987) with 34 studies using this measure. The second most common was also an older measure of negative symptoms – the Scale for the Assessment of Negative Symptoms (SANS) (Andreasen, 1989) with 17 studies using this measure. These measures are the most widely used which reflect the historical conceptualisation of primary and secondary negative symptoms. The newer measures – the Clinical Assessment Interview for Negative Symptoms (CAINS) (Forbes et al., 2010)(k = 5) and the Brief Negative Symptom Scale (BNSS) (Kirkpatrick et al., 2011)(k=2) were used far less often in these studies. All these measures take the form of a semi-structured interview conducted by the researcher who then assigns scores for the different items on the scale using behavioural anchor points provided. On all of these assessments a higher score reflects more severe symptoms. The most important differences in the newer measures is that they draw a distinction between expressive and experiential symptoms. The CAINS also has a self-report scale developed from its experiential subscale – the Motivation and Pleasure Scale – Self Report which is used in 3 studies. The SANS is a detailed measure with 5 subscales that have been retrospectively divided into expressive and experiential symptoms, but this was not specified in its development and validation. The PANSS and Brief Psychiatric Rating Scale (BPRS) (k =2) (Overall & Gorham, 1962) do not consider expressive and experiential symptoms separately. Where these data were reported, expressive and experiential subscales from the CAINS, BNSS and SANS were analysed separately in the sub-group meta-analyses. Three is the minimum number of studies needed to conduct a robust sub-group analysis and therefore the studies which solely used the BPRS were not analysed separately.

Measures of depression

Four measures of depression were used in the sample of studies included in the analyses; these are also detailed in Table 1. The most commonly used measure was the Calgary Depression Scale for Schizophrenia (CDSS, k = 34) (Addington, Addington, & Schissel, 1990). This measure was developed specifically for use in this population and the scale was developed not to include items which overlap with negative symptoms. The CDSS is a semi-structured interview with only 9 items and a recent review (Lako et al., 2012) concluded that this measure most reliably distinguishes depressive from negative symptoms in people with schizophrenia. The second most common measure was the Hamilton Depression Rating Scale (HDRS, k = 16) (Hamilton, 1960) which is a more general measure used in many different populations and includes many of the physical symptoms of depression. It is a clinician-rated measure and the 17-item version was commonly used in these studies. The other two measures used, the Beck Depression Inventory (BDI, k = 9) (Beck, Steer, & Carbin, 1988) and the Montgomery-Asberg Depression Rating Scale (MADRS, k = 5) (Williams & Kobak, 2008), were developed initially for the assessment of people with mood disorders and include the full range of depressive symptoms, including cognitive features such as hopelessness and low self-esteem. The BDI can be used as a self-report measure but the MADRS is a clinician-rated interview.

Meta-Analysis Findings

1. Is there a relationship between negative symptoms and depression in people with psychosis?

   The meta-analysis testing the relationship between negative symptoms and depression showed a small but significant association between increased levels of reported negative symptoms and depressive symptoms in people with non-

affective psychosis (k = 56, pooled effect size (ES) = 0.194, 95% confidence interval (CI)=0.141, 0.247, z = 7.20, p<.001) (See Figure 2).

2. Does this relationship vary according to depression or negative symptom measures or subscales used?

The relationship was consistently present across the sub-group analyses looking at each depression and negative symptoms measure. When the most common combination– PANSS Neg and CDSS- was examined the effect size was also small but significant (k = 23, pooled ES=0.135, 95% CI= 0.055, 0.216, z = 3.29, p=.001). The expressive (k =6, pooled ES= 0.189, 95% CI=0.090, 0.288, z= 3.75, p<.001) and experiential (k=12, pooled ES=0.263, 95% CI= 0.185, 0.341, z=6.58, p<.001) subscales also had small but significant relationships with measures of depression which was numerically larger for experiential subscales. However, a significantly higher relationship cannot be concluded definitively as the CIs for the pooled ESs slightly overlap.

Heterogeneity analyses

The full sample included in the main effect analyses showed high levels of heterogeneity (p<.001, I^2=79.5%, τ^2=0.0283) as expected given the wide range of different measures used. The 95% prediction interval (-0.15, .54) is displayed around the main effect size in the Forest Plot (See Figure 2).

In line with this the heterogeneity was lower in the sub-groups analyses (See Appendix for full results) and for expressive (p=.216, I^2=29.3%, τ^2=0.0308) and experiential (p=.263, I^2=25.3%, τ^2=0.007) subscales the heterogeneity was even lower and non-significant.

Publication bias

Visual inspection of the funnel plots showed publication bias to be unlikely. This was confirmed by the Egger's and Begg's tests conducted which found no evidence of publication bias in the main effect analyses (Egger's p=0.962, Begg's p=0.772). This was consistent across the negative symptom (Egger's p=0.138-0.932, Begg's p=0.621-1.0) and depression measures used (Egger's p=0.224-0.687, Begg's p=0.419-0.917).

3. Is this relationship moderated by depressive or negative symptom severity?

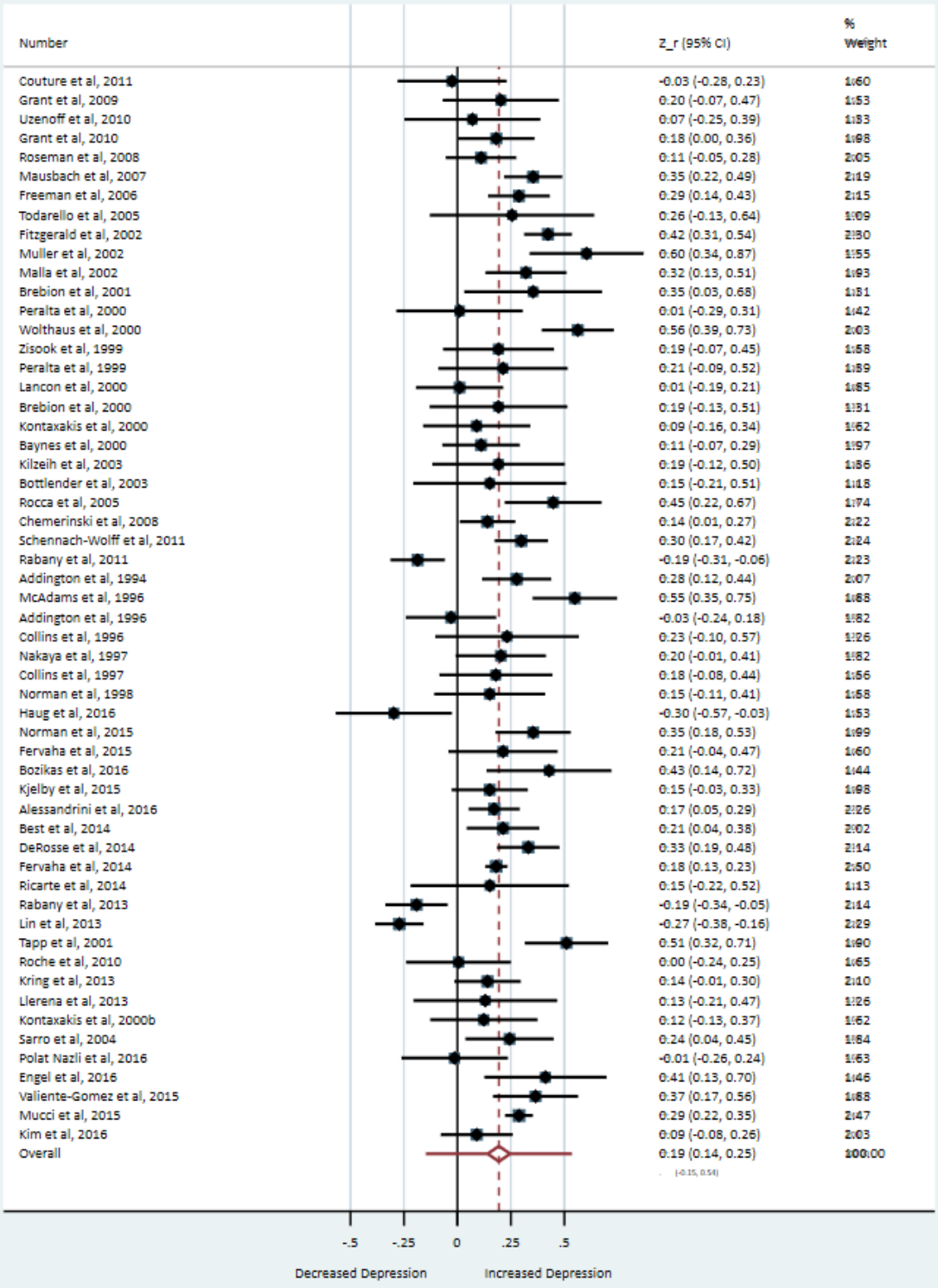
Meta-regression analyses using the subset of the full sample that reported severity scores showed that the severity of depressive symptoms positively predicted a relationship with negative symptoms (k=51, t=2.08, p=.044). Negative symptom severity also predicted the association with depressive symptoms but in the opposite direction (k=43, t= -2.45, p=0.019). As these analyses included the whole sample the heterogeneity was high (I^2res = 78.13%, 73.84%, τ^2=.02579, .02569) and thus the results should be considered in this context.

4. Is this relationship moderated by the diagnosis of the sample, quality of the study or demographic factors?

To investigate whether variables which differ between sample populations account for heterogeneity in findings meta-regression analyses were conducted for demographic data and study characteristics including those studies which reported this data (see Table 1). No significant results were found for age, gender or ethnicity (ts=0.10-0.85, ps=0.418-0.924). The proportion of the sample with schizoaffective disorder also did not significantly moderate the findings (t=0.22,

p=0.829). The quality ratings for each study were also examined to assess whether this moderates the presence of an association between the measures, this analysis was non-significant (t=0.51, p=0.61).

Figure 2: Forest Plot of Relationship between Negative and Depressive Symptoms.



Main effect (95% CIs). Red line around main effect represents 95% prediction interval (-0.15 – 0.54) based on effect sizes included in the meta-analysis.

Discussion

The findings confirm that there is a relationship between negative symptoms and depressive symptoms in people with non-affective psychosis. In the first large meta-analysis to examine this, with data from 56 studies and over 8,000 unique participants, and across a range of measures, a clear pattern emerges showing that higher ratings of negative symptoms are associated with higher levels of depressive symptoms, with a small effect. The relationship was consistent across measures, so it does not appear to be the result of measurement artefacts. The effect size did vary with the measure used, but not greatly. There were no significant moderating effects of demographic or study quality variables suggesting it is robust and generalisable. A non-reciprocal relationship was highlighted in the findings – higher depression severity was linked to higher negative symptom severity but there was an inverse relationship in the other direction whereby higher negative symptom severity was linked to lower depression severity. All these findings support the hypothesis that this relationship represents occurrence in the individuals' experiences as well as phenomenological overlap in these concepts.

These findings support the model proposed in the recent review by Krynicki et al. (2018) which suggests that a dimensional approach to these symptom clusters may best represent this relationship. This approach allows some co-occurrence of these symptoms which the evidence suggests is present. Depression may act as a driver of negative symptoms as proposed in cognitive models of psychosis which highlight the role of emotion in the development of other symptoms e.g. (Garety et al., 2001). Depressive symptoms may also be present because of the impact of negative symptoms on the individual's functioning which reduces opportunities for enjoyable and meaningful activity.

The other factor which may contribute to this relationship is phenomenological overlap in the concepts of negative and depressive symptoms. The expressive and experiential symptoms within the negative symptom cluster are important to consider separately in their relationship with depression. These sub-group analyses suggested that, as expected, the experiential negative symptoms have a stronger relationship with depression than the expressive symptoms. These symptoms of low motivation, apathy and anhedonia are present in the majority of *both* the negative and depressive symptom measures used in the studies in this meta-analysis. Measures such as the CDSS have attempted to reduce phenomenological overlap by excluding these symptoms in their assessment of depression but whether this is a valid approach to measuring depressive symptoms is yet to be addressed. This meta-analysis found a small effect suggesting there are areas where the two symptom dimensions are phenomenologically distinct using current measures. It seems from recent reviews of the area that suicidal ideation, pessimism and guilt are more commonly present due to depressive symptoms. Expressive symptoms, with poorer verbal and emotional expression, are more uniquely found in people experiencing negative symptoms. Clinicians supporting individuals with low motivation and functioning should perhaps assess additionally those areas uniquely associated with the depressive or negative symptom dimensions. Low motivation and functioning can then be considered in this wider context to better identify the contributions of negative and depressive symptoms to the individual's difficulties. Newer measures of negative symptoms and specific cognitive measures in depression e.g. Beck Hopelessness Scale (Beck, Weissman, Lester, & Trexler, 1974) should be considered in this approach.

Importantly, these findings were not moderated by demographic variables such as age, gender and ethnicity suggesting this relationship is present across the course of the illness and the wide range of people who experience non-affective psychosis. The quality ratings

did not moderate the findings, although there was a limited range of scores as a result of the measure used and inclusion criteria applied to the studies. A lot of the studies included people with a diagnosis of schizoaffective disorder in their sample and this did not moderate the findings. This is perhaps surprising as people with schizoaffective disorder might be expected to report more symptoms related to mood. It suggests, although tentatively, that the overlap between depressive and negative symptoms is part of the psychosis spectrum of symptoms. This fits with cognitive models of psychosis which propose a central role of emotion across the psychosis spectrum e.g. (Freeman & Garety, 2003; Garety et al., 2001).

The findings of the meta-regressions showed a non-reciprocal relationship between negative and depressive symptoms. The higher the depressive symptoms reported the more likely they are to demonstrate a positive association with negative symptoms. However, if a person reports higher negative symptoms the less likely they are to be related to depressive symptoms. This is a cross-sectional finding and hypotheses regarding a directional relationship are therefore speculative at this stage. As negative symptom severity increases the person is more likely to experience expressive deficits and greater apathy, or numbing of emotion. This may either limit their ability to report depressive symptoms or be protective against them. It is important to consider that depressive symptoms are more often self-reported whereas negative symptoms are always interviewer-rated. This may explain this non-reciprocal relationship in terms of how symptoms are expressed in an interview – which may be more challenging for someone with high negative symptoms. Negative symptoms may also be a less potent bridge to co-occurring depressive symptoms. The role of depressive symptoms in driving psychosis has been discussed previously and it may be that this is a more potent route to co-occuring negative symptoms.

Limitations of the Review

The main analysis and some of the sub-group analyses had high heterogeneity in the studies include which is a limitation of including different measures in the analysis, although this did increase power. Only two studies were excluded due to missing data, however many studies did not report the demographics of the sample who completed the measures included in this meta-analysis. This limits the conclusions that can be drawn regarding the impact of these variables, particularly ethnicity which was only reported in 10 studies. Meta-analyses that consider symptoms are only as good as the measures of those symptoms that were used. Several studies did not report the total scores for the measures they used and so they could not be included in the meta-regressions conducted, which limits these findings. This review reports interesting findings regarding the negative and depressive symptom measures and it is important to note that they do not represent a homogenous measurement process. More robust conclusions would have been possible with a greater number of studies in the sub-group analyses considering separately expressive and experiential symptoms. Further hypotheses regarding the relationship identified are limited by the lack of depression sub-scales reported in these studies e.g. somatic, cognitive, behavioural. The narrow range of quality ratings provided by the scale used highlights the limitations in applying quality assessment scales to studies included in a rigorous meta-analysis with methodological inclusion and exclusion criteria. This may have limited the power of the moderation analysis of the quality of the studies on the findings.

Clinical Implications

The most important clinical implication of these findings is that depressive and negative symptoms can both be present in people with non-affective psychosis. This means both should be screened for and assessed using the most current and robust measures. It

follows that treatment for both sets of symptoms might be indicated, although further research is required to explore whether this requires targeting the same or different causal mechanisms. These findings also suggest that to capture fully the range of both groups of symptoms, care should be taken in the selection of measures. For depression, measures such as the BDI and CDSS should be used – as they are comprehensive assessments of the symptoms which seem to be more relevant to the depressive dimension i.e. pessimism, suicidal ideation and somatic symptoms. For negative symptoms, clinicians should also prioritise using newer measures which assess anticipatory and consummatory pleasure separately as well as reporting separate subscales for expressive and experiential symptoms which have been shown to be robust. By using this combination of measures the assessment will provide a full picture of the difficulties the individual is currently experiencing and will also suggest the specific contributing areas of negative and depressive symptomatology.

The findings of this meta-analysis highlight the importance of mood across the psychosis spectrum as proposed in several cognitive models of psychosis e.g. (Birchwood, 2003; Chadwick, Birchwood, & Trower, 1996; Freeman, Garety, Kuipers, Fowler, & Bebbington, 2002; Garety et al., 2001). A dimensional approach to considering these symptoms across the traditional depression/negative symptoms divide may have the highest clinical utility (van Os & Reininghaus, 2016). Indeed, depressive symptoms have also been shown to be associated with other dimensions within psychosis, including positive symptoms (Hartley, Barrowclough, & Haddock, 2013). To this end, targeting specific constructs when intervening e.g. low motivation or hopelessness may be a useful approach going forwards in both clinical work and research. Clinicians working in this area may consider using approaches targeting these symptoms from other fields such as depression or motivational interviewing. This is particularly true in the field of negative symptoms where there is not a

clear intervention to provide; several different approaches – family therapy, social skills training and Cognitive Remediation Therapy (CRT) have been shown to have an impact on negative symptoms (Cella, Preti, Edwards, Dow, & Wykes, 2017; Elis, Caponigro, & Kring, 2013; Lutgens, Gariepy, & Malla, 2017) but this is often as a secondary outcome and not a primary target. There is one trial of long-term CBT targeting negative symptoms which found a significant improvement in apathy (Grant, Huh, Perivoliotis, Stolar, & Beck, 2012). CBTp trials often report improvement in depressive symptoms (Peters et al., 2015; Wykes, Steel, Everitt, & Tarrier, 2008) but the benefit for negative symptoms is less clear (Velthorst et al., 2015). However, a recent large-scale study (Super-EDEN) in the UK has shown that levels of depressive symptoms at baseline can worsen the trajectory of negative symptoms suggesting that early intervention in both these dimensions is important (Gee et al., 2016). It may be that therapy needs to be further adapted to target negative symptoms and the findings of this meta-analysis suggest approaches that have been successful in depression could also be effective in alleviating negative symptoms, especially in the milder range.

Future Research

The large majority of studies included in this meta-analysis used older measures of negative symptoms and did not report experiential and expressive subscales. This limits our understanding of how to best assess and understand the relationship with depression. Future research studies should use newer measures of negative symptoms i.e. CAINS or BNSS and should always report the expressive and experiential subscales. Similarly, it is positive that so many studies measure depressive symptomatology using validated scales. However, subscales are not reported and given the wide range of depressive symptomatology this means our understanding of how people with non-affective psychosis experience of depression is very limited. Studies should report separately somatic and cognitive symptoms of depression, especially if they are examining a link with negative

symptoms. The high levels of heterogeneity in this analysis reflect the wide range of measures used and thus to improve the robustness of future meta-analyses consistent approaches to the measurement of depression and negative symptoms should be adopted. Focusing on newer measures of negative symptoms and validated depression measures will ensure this.

Trials of new, targeted psychological interventions for negative and depressive symptoms in non-affective psychosis should be a priority. Theoretical understanding of their causes and maintenance factors, to identify optimal treatment targets is similarly important. The impact of these symptoms is at least as, if not more significant than any other group of symptoms and they are a priority for service users (Rose, 2014). The findings of this meta-analysis show that there is a relationship between these two symptom dimensions and considering negative symptoms and depression as separate diagnostic categories is no longer a valid approach in non-affective psychosis.

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Appendix

Sub-Group Effect Analyses

The negative symptom measures all demonstrated a small but significant relationship with depressive symptoms (all measures included) in the sub-group analyses; the CAINS (k=5, pooled ES=0.188, 95% CI=0.046-0.330, z=2.59, p=0.01), SANS (k=18, pooled ES=0.281, 95% CI=0.219-0.343, z=8.87, p<.001) and PANSS-Neg (k=34, pooled ES=0.162, 95% CI=0.089-0.234, z=24.35, p<.001). The SANS showed the strongest relationship with depressive symptoms and the PANSS-Neg had the smallest effect size – this may reflect the larger number of items and therefore wider range of symptoms assessed by the SANS.

The depression measures also demonstrated a consistent small but significant relationship with negative symptoms (all measures included). The MADRS (k=5, pooled ES=0.334, 95% CI=0.162-0.506, z=3.81, p<.001), the BDI (k=9, pooled ES=0.198, 95% CI=0.135-0.261, z=26.14, p<.001), the HDRS (k=16, pooled ES=0.284, 95% CI=0.212-0.357, z=7.68, p<.001) and the CDSS (k=35, pooled ES=0.156, 95% CI=0.095-0.217, z=5.01, p<.001). the MADRS showed the strongest association with negative symptoms although the number of studies is small. The CDSS had the smallest effect size and this supports the conclusion of the Lako et al, 2012 review that this measure of depression most reliably distinguishes from negative symptoms in psychosis.

Heterogeneity in Sub-Group Analyses

The negative symptom measures vary in the heterogeneity in the studies included, perhaps to some extent due to the different numbers of studies included in each group. The SANS

shows low heterogeneity (p=.080, I^2=34.5%, τ^2=0.0055) and the CAINS is moderate (p=.046, I^2=58.6%, τ^2=0.0149). The PANSS-Neg, which is most commonly used has high heterogeneity at a similar level to the main effect analysis (p<.000, I^2=81.6%, τ^2=0.0308). The depression measures showed moderate heterogeneity (ps<.05, I^2=48.3-75.4%, τ^2=0.0097-0.0242) with the exception of the BDI which showed very low heterogeneity amongst the 9 studies included in the analysis (p=.701, I^2=0.0%, τ^2=0.0000). These statistics represent 0% of the effect size attributed to between-study variance in studies using the BDI.

Quality Assessment Tool for Quantitative Studies- Adapted Version

COMPONENT SCORES

A) SELECTION BIAS

(Q1) Are the individuals selected to participate in the study likely to be representative of the target population?

4 Very likely

3 Somewhat likely

2 Not likely

1 Can't Tell

(Q2) What percentage of selected individuals agreed to participate?

4 80-100% agreement

3 60-79% agreement

2 <60% agreement

1 Can't Tell

Score this section	Very Strong	Strong	Moderate	Weak
	4	3	2	1

B) STUDY DESIGN

(Q3) Was there a clear hypothesis stated and matching design for the study?

0 No

1 Yes

C) DATA COLLECTION METHODS

(Q4) Were data collection tools shown to be valid?

3 Yes

2 No

1 Can't tell

(Q5) Were data collection tools shown to be reliable?

3 Yes

2 No

1 Can't tell

(Q6) Are dimensional scales reported for negative symptoms?

0 No

1 Yes

Score this section	Strong	Moderate	Weak
	3	2	1

D) MISSING DATA

(Q7) Were missing data reported in terms of numbers and/or reasons?

3 Yes

2 No

1 Can't tell

(Q8) Indicate the percentage of participants completing the study.

4 80 -100%

3 60 - 79%

2 less than 60%

1 Can’t tell

Score this section	Strong	Moderate	Weak
	3	2	1

E) ANALYSES

(Q9) Are the statistical methods appropriate for the study design?

3 Yes

2 No

1 Can’t tell

(Q10) Was the significance level adjusted appropriately for the number of comparisons being conducted?

3 Yes

2 No

1 Can’t Tell

Score this section	Strong	Moderate	Weak
	3	2	1

Quality Assessment Tool for Quantitative Studies: Guidance for Scoring

A) SELECTION BIAS

(Q1) Participants are more likely to be representative of the target population if they are randomly selected from a comprehensive list of individuals in the target population (score very likely).

They may not be representative if they are referred from a single setting (e.g. outpatient or inpatients only) in a systematic manner (score somewhat likely).

The sample is even less likely to be representative if from a single ward or service or if they have self-referred (score not likely).

(Q2) Refers to the % of subjects in the control and intervention groups that agreed to participate in the study before they were assigned to intervention or control groups. If this is not reported then score this as "can't tell".

A Overall Score(1-3)

Very Strong: The selected individuals are very likely to be representative of the target population (Q1 is 4) and there is greater than 80% participation (Q2 is 4).

Strong: The selected individuals are at least somewhat likely to be representative of the target population (Q1 is 4 or 3); and there is 60 - 79% participation (Q2 is 3).

Moderate: The selected individuals are at least somewhat likely to be representative of the target population (Q1 is 4 or 3); and participation is not described (Q2 is 1) or below <60% (Q2 is 2).

Weak: The selected individuals are not likely to be representative of the target population (Q1 is 2); or there is less than 60% participation (Q2 is 2) or selection is not described (Q1 is 1); and the level of participation is not described (Q2 is 1).

B) STUDY DESIGN

Q3) Important to consider whether a clear hypothesis was stated and the design of the study was appropriate to address this (Yes/No).

C) DATA COLLECTION METHODS

Q4,5) Tools for primary outcome measures must be described as reliable and valid. If 'face' validity or 'content' validity has been demonstrated, this is acceptable.

Reliability and validity can be reported in the study or in a separate study. For example, some standard assessment tools have known reliability and validity.

Additional question inserted regarding the method of reporting the subscales as dimensional scales considered to be of a higher standard particularly in the field of negative symptoms.

C Overall Score (1-3)

Strong: The data collection tools have been shown to be valid (Q4 is 3); and the data collection tools have been shown to be reliable (Q5 is 3). Dimensions are reported rather than only total scale scores.

Moderate: The data collection tools have been shown to be valid (Q4 is 3); and the data collection tools have not been shown to be reliable (Q5 is 2) or reliability is not described (Q5 is 1). Dimensions are either reported or omitted (1 or 0).

Weak: The data collection tools have not been shown to be valid (Q4 is 2) or both reliability and validity are not described (Q4 is 1 and Q5 is 1).

D) WITHDRAWALS AND DROP-OUTS

Q 7,8) Score YES if the authors describe BOTH the numbers and reasons for withdrawals and drop-outs. Score NO if either the numbers or reasons for withdrawals and drop-outs are not reported.

The percentage of participants completing the study refers to the % of subjects remaining in the study at the final data collection period in all groups (i.e. control and intervention groups).

D Overall Score (1-3)

Strong: will be assigned when the completion rate is 80% or greater (Q7 is 4).

Moderate: will be assigned when the completion rate is 60 – 79% (Q8 is 3).

Weak: will be assigned when a completion rate is less than 60% (Q8 is 2) or any missing data were not described (Q8 is 1).

E) ANALYSIS APPROPRIATE TO QUESTION

E Overall Score (1-3)

Strong: will be assigned when the analysis is appropriate and the significance level accounts for the number of comparisons conducted (Q9 and 10 are both 3)

Moderate: will be assigned when the analysis is appropriate but the significance level has not been adapted. (Q9 is 3 and Q10 is 2)

Weak: will be assigned the suitability of the analyses and the adjustment of the significance level is not clear (Q9 and 10 are 1).

Maximum Possible Score: 14

Original sections: C,D and G have been omitted as the only apply to studies which consider between-groups analyses. This is not relevant to the research question considered in this review.

Main Research Project: *The Role of Autobiographical Memory Deficits in the Experiential Negative Symptoms of Psychosis*

Main Supervisor: Dr. Amy Hardy

Second Supervisor: Professor Philippa Garety

Contents

Table of Tables

Table of Figures

Table 1: Table of Included Studies 17
Table 2: Full Quality Ratings of Included Studies 23
Table 3: Correlational Analyses 81

Abstract

People with a diagnosis of psychosis often experience low motivation and reduced activity levels. Autobiographical memory retrieval has been shown to be over-general (i.e. lacking specific autonoetic details) in people with psychosis and this may limit the ability of memories to support motivation. Study 1 aimed to investigate this relationship by conducting assessments of autobiographical memory alongside symptom measures. Study 2 used an up-to-date protocol from the depression field to develop a protocol for targeting experiential negative symptoms, such as low motivation, using supported autobiographical memory retrieval. This pilot study assessed feasibility and acceptability and preliminary effect sizes. The results of Study 1 showed that autobiographical memory deficits are linked to self-defeatist beliefs, working memory and functioning but not directly to negative or depressive symptoms. Study 2 found that the protocol developed was acceptable and feasible to those who took part. Participants were able to generate positive autobiographical memories linked to their goals and experience appropriate emotions linked to these. The preliminary effect sizes showed encouraging signals for self-efficacy, motivation and a reduction in negative mood. These findings suggest that autobiographical memory may play a role in reducing functioning and self-efficacy beliefs in people with psychosis. Positive memories and emotions are an important therapeutic mechanism and guided autobiographical memory retrieval may be an effective way tool for targeting this in people with psychosis.

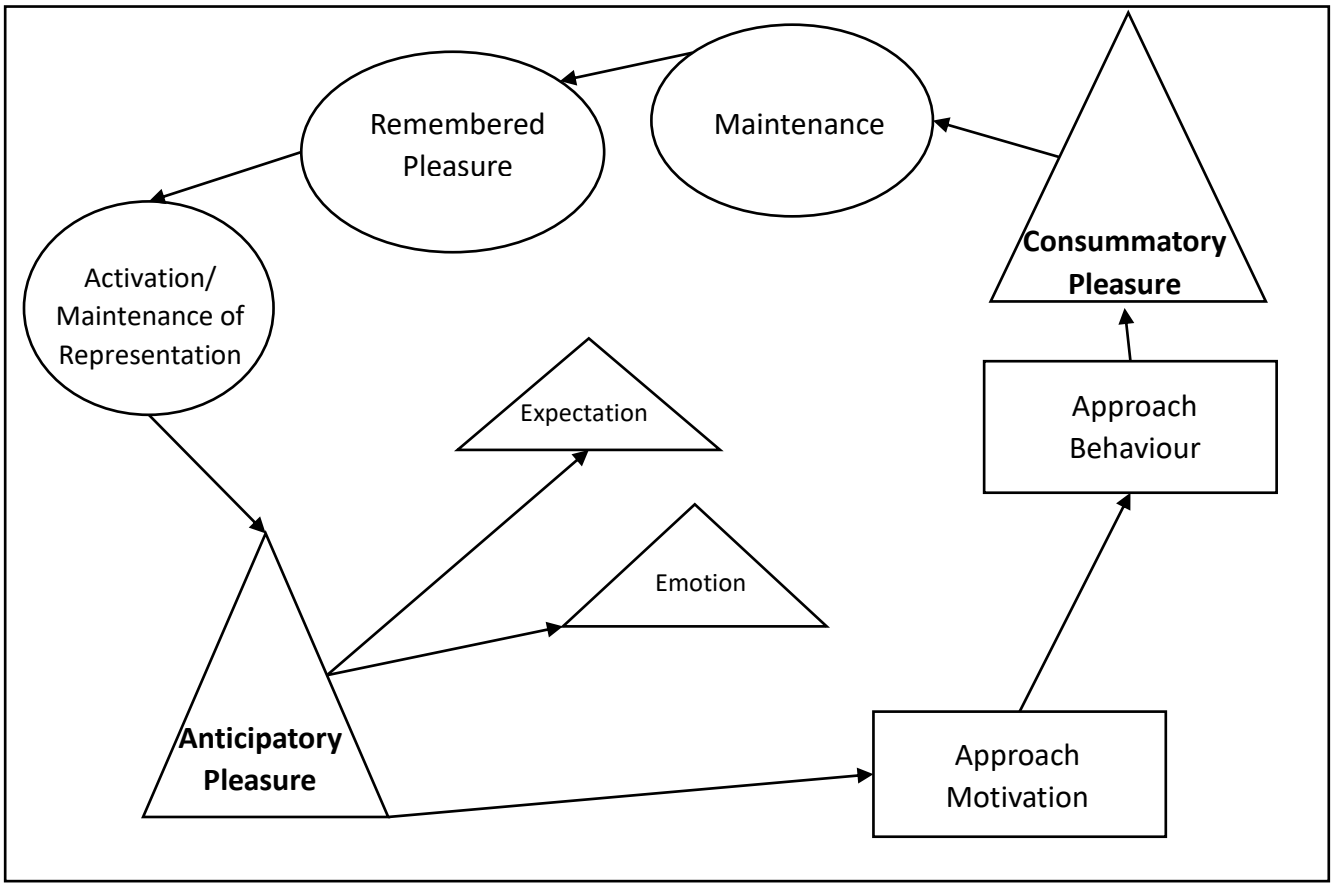
Introduction

Psychotic disorders have been shown to be among the top ten causes of disability worldwide (The Schizophrenia Comission, 2012). Psychosis can be conceptualised as reflecting five main symptom clusters; excited, cognitive, affective, positive and negative e.g. (Wallwork, Fortgang, Hashimoto, Weinberger, & Dickinson, 2012). Positive symptoms include delusions and hallucinations and negative symptoms have been defined by the National Institute of Mental Health (NIMH) Consensus according to the dimensions of anhedonia and apathy, avolition and asociality, poverty of speech and blunted affect (Kirkpatrick et al., 2006). Negative symptoms appear to play a significant role in outcomes for people with psychosis, as they are associated with poorer social functioning, work/school functioning and activities of daily living (Marchesi et al., 2015; Menendez-Miranda et al., 2015; Robertson et al., 2014). Service users have also identified apathy and low motivation as a priority for recovery (Sterk, Winter van Rossum, Muis, & de Haan, 2013). In a qualitative study, mood and happiness were also highlighted as key to the process of recovery (Wood, Price, Morrision, & Haddock, 2013). Despite this wealth of evidence highlighting the importance of negative symptoms to service users and therefore of developing effective interventions to alleviate negative symptoms, the only recommended treatment in the NICE (2014) guidelines is arts therapy, for which the evidence for effectiveness is limited. A recent meta-analysis confirmed that available treatments show modest effectiveness at best, with many having no effect at all (Fusar-Poli et al., 2015).

Many factor analyses conducted show that negative symptoms are best characterized in two broad categories; 'experiential' negative symptoms such as apathy, anhedonia and asociality and 'expressive' negative symptoms including poverty of speech and blunted affect (Messinger et al., 2011). Experiential negative symptoms have been

shown to account for between 7 and 19% of functional outcomes over an 18-month period in people with a diagnosis of schizophrenia, far beyond any other symptomatology assessed (Fervaha et al., 2014). One cognitive model that has been proposed for experiential negative symptoms is the Temporal Experience of Pleasure Model (Kring & Barch, 2014; Kring & Caponigro, 2010)(see Figure 1).

Figure 1: The Temporal Experience of Pleasure model. Triangles represent pleasure-related processes, ovals represent autobiographical episodic memory and working memory components and rectangles represent motivation and activity.



The Temporal Experience of Pleasure (TEP) model proposes an important role for memory in the generation of anticipatory pleasure and subsequent motivation and engagement in activity. It argues that episodic memory is involved, which is defined as the memory for specific autobiographical events. These memories for past personal experiences allow the person to figuratively travel back in time to the event that took place at that particular time and place (Tulving, 1972). Episodic memories are part of

autobiographical memory, which also includes semantic knowledge about the world and the self (Conway & Pleydell-Pearce, 2000). The TEP model proposes that during an activity the pleasure being experienced is held online in working memory whilst it is encoded into episodic memory. When the opportunity to repeat this, or a similar activity, is presented the individual retrieves relevant episodic memories and holds these representations online in the working memory (Kring & Caponigro, 2010). If there is a failure to retrieve the details of a memory or the associated emotion, then this may lead to failure to anticipate pleasure from and then repeat that activity. A recent meta-analysis highlights the following areas where episodic memory retrieval deficits are consistently reported in people with a diagnosis of schizophrenia: memory specificity for past events, richness of memory detail, and conscious recollection (Berna, Göritz, et al., 2016).However, links between symptomatology and these deficits are unclear in the existing literature. For example, there are mixed findings regarding whether there is a link between these impairments and experiential negative symptoms (Berna, Göritz, et al., 2016; Harrison & Fowler, 2004; Ricarte et al., 2014). One reason for this might be methodological. The methodology used across studies to assess memory is relatively consistent, with the autobiographical memory test (Williams & Broadbent, 1986) utilised in the majority of studies. This task may have some limitations due to its reliance on event cue words e.g. “birthday” rather than specific prompting of episodic memories of a particular valence, reducing its ecological validity. It may be more valid to prompt the recall of autobiographical episodic memories from an individual’s life history. A further limitation of this evidence base is that studies have employed negative symptom measures such as the Positive and Negative Syndrome Scale (Kay et al., 1987) and the Scale for the Assessment of Negative Symptoms (Andreasen, 1989). These have been criticized for not accurately discriminating between expressive and experiential negative symptoms (Edwards et al., 2015a; Messinger et al., 2011). In sum, although plausible and predicted theoretically, it is not clear from the existing evidence

whether impairments in the retrieval of episodic memories may be linked to negative symptoms, experiential or expressive, in psychosis. This study will therefore first examine the relationships between autobiographical memory and negative symptoms using the most valid measures to address this question.

As noted above, given their role in recovery and service users views, there is a need for new interventions for negative symptoms in psychosis. To improve the effectiveness of cognitive-behavioural therapies for psychosis, an interventionist-causal method is recommended (Freeman, 2011). The premise of this approach is to focus on one putative causal mechanism, demonstrate whether it can be altered and then examine the effect on the target symptoms. For example, the causal role of worry and reasoning biases in paranoia has been demonstrated, and interventions targeting these processes show promise (Freeman et al., 2015; Garety et al., 2014). The foregoing literature suggests that impairments in episodic memory may play a causal role in negative symptoms.

This study will therefore employ a causal interventionist approach to investigating the potential causal role of autobiographical episodic memory in negative symptoms. The current evidence base relevant to episodic memory in people with a diagnosis of psychosis includes two intervention studies. The first primarily targeted the specificity of episodic memory and hypothesised a subsequent reduction in depressive symptoms in people with persistent psychosis. The intervention was conducted in a group format, with an active control condition of occupational therapy and social skills sessions. Participants (n = 24), who had low levels of psychosis symptoms at baseline, were encouraged to keep diaries with specific daily memories and their associated emotions, which was then extended to more historical memories from childhood, adolescence and adulthood. The intervention improved memory specificity and depression symptoms but there was no subsequent improvement in negative symptoms. However, these were not a primary target of the

intervention and were assessed using older measures which do not comprehensively assess experiential negative symptoms (Ricarte, Hernandez-Viadel, Latorre, & Ros, 2012). Another study targeted the potential causal link between over-general memory and low anticipatory pleasure for future events, one aspect of experiential negative symptoms. The study included 32 participants with schizophrenia-spectrum diagnoses. The results showed that recalling a memory in response to event-related cues such as "birthday" or "argument" before completing a prospective task enhances anticipatory pleasure for the future activity (Painter & Kring, 2016). These studies suggest that interventions targeting memory in this population can improve aspects of memory and a recent review highlighted the potential for utilising these further in this population (Ricarte, Ros, Latorre, & Watkins, 2017). But the link with negative symptom outcomes remains to be systematically targeted and explored.

Over-general autobiographical memory does however have a well-established role in the symptoms of depression and subsequent reduced functioning (Williams et al., 2007). There is a growing evidence base for memory specificity training in depression (Dalgleish et al., 2014; Köhler et al., 2015; Neshat-Doost et al., 2012) which has been shown to be effective in reducing depressive symptoms during acute and remission periods. As described in the meta-analysis presented in this thesis there does appear to be a link between negative and depressive symptoms in psychosis, but the nature of this relationship is unclear. The effectiveness of these interventions in depression and the link between these symptoms further supports piloting these interventions in psychosis. Memory specificity training in depression is undergoing some refinement as there may be difficulties beyond the retrieval specificity of negative memories. There also appears to be impairment in the ability to generalise from positive events to broader themes in people with depression. As well as recalling detail in our episodic memories, "zooming in", it is important for our mental health to be able to "zoom out" and generate broad ideas from

an event memory to develop and maintain a functional conceptualisation of self in autobiographic memory. To reflect these up to date developments in the field the intervention utilised in this study will incorporate ideas from the MemFlex approach (Hitchcock, Werner-Seidler, Blackwell, & Dalgleish, 2017). Memflex has been developed as a self-help intervention where individuals are given the rationale for focusing on their autobiographical memory and exercises which practice both "zooming in" and "zooming out" to improve both specificity of negative memories and generalisability of positive memories.

The evidence reviewed so far suggests that impairments in episodic memory retrieval are present in people with a diagnosis of psychosis. There also appears to be a link between depressive and negative symptoms. However, findings regarding the links between these episodic memory impairments and symptoms are somewhat equivocal, which may be attributable to the limitations of negative symptoms and episodic memory measures, and small sample sizes. Robust investigation of the potential causal mechanism of episodic memory impairments in negative symptoms is important because they are a potential treatment target in an area with very few evidence-based interventions and a large unmet need. The target outcomes of this intervention study were important components of negative symptoms previously identified and used in similar previous studies: positive affect, negative affect, motivation and anticipatory pleasure (Edwards et al., 2015a; Painter & Kring, 2016; Sanchez, Lavaysse, Starr, & Gard, 2014). A measure of self-efficacy was added as a novel outcome measure as this has recently been highlighted as a potential causal mechanism in negative symptoms and poor functioning (Campellone, Sanchez, & Kring, 2016; Staring, Ter Huurne, & van der Gaag, 2013).

The overall aim of this research is to investigate the role of impaired autobiographical episodic memory retrieval in experiential negative symptoms in people

with schizophrenia. First, in Study 1 cross sectional associations were examined using the most valid measures of these constructs. Negative symptoms were assessed using the Clinical Assessment Interview for Negative Symptoms (CAINS) which incorporates an experiential and expressive subscale allowing these to be considered separately. Important potential confounders highlighted in the literature such as depression, working memory and defeatist beliefs were also assessed. Second, in Study 2 a brief novel intervention was piloted to test the feasibility of using autobiographical memory to target motivation, self-efficacy and anticipatory pleasure in people with psychosis. This study further explored the potential causal mechanism of autobiographical episodic memory retrieval in negative symptoms.

Research Questions and Hypotheses

The research questions for Study 1 are as follows:

1. Is reduced autobiographical memory specificity associated with higher levels of experiential negative symptoms and lower functioning?
2. Are these relationships moderated by depressive symptoms or cognition?

Study 1 Hypotheses

3. People with psychosis will generate valid positive and negative valence autobiographical memories.
4. The negative memories generated will have reduced specificity compared to positive memories.
5. Autobiographical memory will be associated with experiential negative symptoms, verbal fluency, working memory, functioning and depression.

The research questions for Study 2 are as follows:

1. Is a brief novel intervention designed to enhance retrieval of a positive autobiographical memory feasible and acceptable to people with psychosis?

2. Does a pilot intervention designed to enhance retrieval of a positive autobiographical memory show evidence of a subsequent improvement in a state assessment of experiential negative symptoms and functioning (i.e. mood, motivation, self-efficacy and anticipatory pleasure for a possible future event) and what are the preliminary estimates of effect sizes and confidence Intervals of any potential changes?

Study 2 Exploratory Aims:

a. The intervention will be feasible to deliver, and the following information will be reported to assess this: rates of referral, participants meeting eligibility criteria, consent rates and therapy adherence.
b. Participants will generate appropriate activities and linked memories and the nature of these will be reported.

Study 2 Hypotheses:

c. Participants will generate vivid, positive memories in both conditions, but these will be rated as more pleasant and real in the guided recall condition.
d. Participants will rate the intervention as acceptable and helpful - rated as 80% or higher on these scales in the evaluative questionnaire.

Methods

Study Outline

This project is divided into two sub-studies to address the research questions. The first study is a cross-sectional study and the second is a pilot intervention study. The inclusion/exclusion criteria for the sample (who participated in both studies) and the power calculations conducted to determine the number of participants required are described in this section. The measures used, and the development of the therapeutic intervention are outlined and the analysis plan is presented. All research procedures employed in this thesis received ethical approval from the London – Camberwell St Giles Research Ethics Committee (REF: 17/LO/0009) and Health Research Authority (HRA) Approval to be

conducted in the NHS, all relevant documents are included in the Appendix. The protocol for this study was also published on clinicaltrials.gov.uk.

Study Design

A sample was recruited to participate in both studies. Study 1 had a cross-sectional design with the aim of examining hypothesised relationships between autobiographical memory and experiential negative symptoms. Study 2 had an experimental design with the aim of assessing feasibility and deriving preliminary estimates of effects, and the participants were randomized to either the intervention or control condition with a randomisation ratio of 2:1. This ratio was selected to maximise the information gathered about the intervention and avoid significant loss of power from drop-out in the intervention condition (Dumville, Hahn, Miles, & Torgerson, 2006).

Sample

Participants were recruited from inpatient and community psychosis services across South London and Maudsley NHS Trust.

Inclusion Criteria

- Diagnosis of non-affective psychosis (as determined by medical records).
- Aged 18 - 65yrs
- Sufficient English language to participate in the research.

Exclusion Criteria

- Lack of capacity to provide informed consent to take part in the study.
- Primary diagnosis of intellectual disability, head injury, substance misuse or known organic cause of psychosis.

Recruitment Procedure

Participants were recruited through their clinical team. The participant was first approached by a member of their care team to introduce the study. If they indicated that they were willing to consider the project and gave verbal consent for the researcher to contact them then they were provided with the information sheet (see Appendix for

information sheet and consent form). The researcher then contacted them again after at least 24 hours to discuss their potential participation.

Participants were reimbursed £15 for their participation in the cross-sectional study and £10 for their time in the intervention session.

Power Analyses

A power analysis was conducted in GPower Software Version 3.1 (Faul, Erdfelder, Lang, & Buchner, 2007). Power was set at 0.8, $\alpha = 0.05$ and the analysis was conducted for a two-tailed hypothesis due to limited literature reporting an association in one direction. These criteria are in line with the parameters set in the field of psychology research (Field, 2009). The power calculation was conducted for Study 1 and found a sample size of 32 would be sufficient to replicate a correlation with a medium effect size of 0.43 reported between memory specificity and negative symptoms by Harrison and Fowler (2004). Study 2, as a feasibility study, was not powered for significance testing of effects, but the sample size for study 1 was deemed to be suitable for examining feasibility outcomes.

Measures

The measures are all included in the Appendix.

Study 1: Cross-Sectional Study

Autobiographical Memory Test (AMT) (Williams & Broadbent, 1986)

This task presents participants with cue words and asks them to generate specific autobiographical memories in response. An example is usually given by the experimenter as part of the instructions and participants complete at least one practice trial and receive feedback. In previous studies using this task the memories generated are coded by the experimenter (Dritschel, Beltosis, & McClintock, 2014). Some studies have also asked participants to rate their experience of recalling the memory (D'Argembeau & Van der Linden, 2004). A recent study adapted the AMT to incorporate both interviewer and participants ratings of the memory (Painter & Kring, 2016) and this version was used in Study 1 and then adapted for use in Study 2. This measure was selected as it has been

shown to be valid and reliable in this population when using general prompts (e.g. positive/negative events) as well as more specific prompts (e.g. fairground) (Berna, Potheegadoo, et al., 2016; Painter & Kring, 2016). It has been shown that specific cues considered to be positive or negative when used in control populations can result in different emotional responses from people with psychosis (Edwards, Cella, Tarrier, & Wykes, 2015b). Therefore, it was considered important to provide general prompts for this task and give the individual flexibility to choose memories that they identified as positive or negative. Shortened versions of this task have also been shown to be robust and this was an important consideration when designing the burden of the assessment session on participants.

Participants were asked to generate a narrative for an event that occurred in the past at a specific time and place and did not last longer than one day. They were asked to do this for 2 separate events, one positive and one negative. The participants completed one practice trial where they were asked to generate a narrative for a time when "they listened to music or the radio". The participant was given feedback on this practice trial (e.g. "Exactly, now do the same for the rest of the narratives", or "Good, but for the rest of the task please tell me about an event that occurred at a specific time or place") and then begin the memory task. For each cue the participant was prompted as follows: "Picture a specific time in the past when a [positive or negative] event occurred. Tell me about it in as much detail as possible, as if you were telling a story."

Participant Ratings

The participants then completed a questionnaire relating to the memory to assess how detailed they found the experience and how positive or negative they found the memory to be (see Appendix X). This questionnaire used visual analogue scales with anchors at 0, 50 and 100 and participants were asked to place a cross on the line to mark their response.

Interviewer Ratings

The researcher then rated the memory on the following areas:

- Time/place specificity
- Sociality
- Elaborative detail
- Clarity
- Emotional content

These ratings are broadly in line with those adopted in the Painter and Kring (2016) study with the addition of a rating for emotional content which was considered important due to the evidence that this may be limited in people with psychosis (Herbener, 2008). Of these memories, 10% (n = 8) were coded by an independent researcher and were found to have excellent reliability (ICC = .96, 95% CIs = .82 - .99).

Verbal Fluency Test (Lezak, Howieson, Bigler, & Tranel, 2012)

The FAS and categories subtests from this task aim to assess verbal fluency. Participants are asked to generate as many words (not proper nouns) as they can which start with a certain letter (F, A and S) and then do the same for categories of words (e.g. animals) over the period of 1 minute. It has been shown to be a valid and reliable measure in psychosis (Joyce, Collinson, & Crichton, 2009). The evidence suggests that people with non-affective psychosis have difficulties with generation and fluency (Henry & Crawford, 2005) and this might impact on their ability to communicate their memories despite recalling them.

Letter-Number Sequencing (Wechsler, 2011)

This task involves remembering groups of numbers and letters following one verbal presentation and then repeating them back to the examiner, numbers first in numerical order followed by the letters in alphabetical order. This test is included as a reliable and

valid brief assessment of working memory which again is an area where people with psychosis have been shown to have difficulty (Lee & Park, 2005). This may also compromise their ability to present an autobiographical memory narrative and therefore it is included as a potential moderator.

Beck Depression Inventory (Beck, Steer, & Brown, 1996)

This 21-item self-report scale, rated on a 4-point scale from 0 – 3 (total score ranges from 0 to 63, >13 indicates a clinically-relevant level of depression) was used to assess depression severity. In the meta-analysis findings reported in this thesis and in the wider literature the BDI has been identified as a reliable measure in people with psychosis e.g. (Chemerinski et al., 2008).

Defeatist Performance Beliefs - Dysfunctional Attitudes Scale (Weissman & Beck, 1978)

This 15-item subscale was included as an assessment of defeatist beliefs. Each item consists of a statement and a 7-point Likert scale (1 = fully disagree to 7 = fully agree). The total score ranges from 15 – 105 with higher scores indicating more defeatist beliefs. This scale has been used extensively in people with psychosis and has been shown to be reliable and valid (Campellone et al., 2016; Grant & Beck, 2009).

Clinical Assessment Interview for Negative Symptoms (Kring et al., 2013)

This recently developed interview assesses negative symptoms in schizophrenia. It has two negative symptom factors: experiential and expressive. Each item is scored from 0 = no impairment to 4 = severe deficit. An experiential item requires asking the participant questions such as “Have you spent much time with your family in the last week?” and “Is having a relationship with your family important to you?” Motivation for family relationships is rated according to answers to these and further questions. The interview then asks how many pleasurable social activities have occurred in the last week and how many are expected next week. These two answers are used to rate the current and anticipated frequency of pleasurable social activities. Expressive items are rated by the

interviewer based on their observations during the assessment e.g. facial expression, vocal expression. CE was trained in conducting the CAINS interview by a researcher on a clinical trial using observations of previous recorded interviews. The subscales have good internal consistency, as does the complete measure which has been shown to be reliable and valid (Kring et al., 2013).

Time Use Survey (Hodgekins et al., 2015)

The Time Use Survey is administered in an interview format. It provides a measure of functioning by assessing how much time is spent on a range of activities. It produces two scores in hours per week: one for Constructive Economic Activity (CEA) and one for Structured Activity (SA). The CEA score includes time spent in employment, studying, housework, childcare and looking for work or education. The SA score includes the CEA score plus more recreational activities such as hobbies and socialising. The Time Use Survey provides information on activities completed and time spent in a wide range of domains including leisure and work/study. This is an advantage over other performance-based assessments or questionnaires that ask for frequency but not duration of activities. The Time Use Survey has been extensively validated in the UK general population (Gershuny, 2011; Lader, Short, & Gershuny, 2006) and in people with a diagnosis of schizophrenia (Fowler et al., 2009; Hodgekins et al., 2015).

The Scale for the Assessment of Positive Symptoms (Andreasen, 1984)

This scale was used as a measure of positive symptom severity, each item is rated from 0 (absent) to 5 (severe). Two subscales; hallucinations (7 items) and delusions (13 items) were assessed. CE was trained in conducting the SAPS by one of the research supervisors who has a wealth of experience using the measure. The SAPS has been shown to be a reliable and valid measure of these symptoms in psychosis and has been used in multiple previous studies.

Study 2: Pilot Feasibility Study

Acceptability and Feasibility Outcomes

The number of participants referred to the study is reported as an indicator of appropriate referrals. The completion rates of individuals taking part in the session is also recorded to assess the adherence to the protocol. The ability of participants to generate activities for discussion in the session and associated positive memories are reported. The categories of activity selected by participants is reported.

Intervention Feedback Questionnaire

A feedback questionnaire which utilised the same visual analogue scales (0-100) was given to the participants in both the basic recall and guided recall conditions to gather their feedback on their experience of taking part. Questions with space for participants to provide written feedback were also included in this questionnaire. The findings from this questionnaire were used to assess the acceptability of the intervention and evaluate the service user experience.

Pre- and Post-Intervention Measure

A measure was developed based on "in the moment" assessments of mood, motivation, anticipatory pleasure and self-efficacy that have been used in previous experience sampling studies (Edwards, Cella, Tarrier, & Wykes, 2016; Oorschot et al., 2013). These areas were included as they are hypothesised to be the areas where change may be seen as a result of the intervention based on previous studies (Ricarte et al., 2012). Visual analogue scales were used with anchor points at 0, 50 and 100 and participants were asked to place a cross on the line to mark their response.

Intervention Condition: Guided Recall

Participants were shown a psychoeducation video developed for this study which presents three stories with examples of how memory impacted on motivation to engage in certain activities. This was paused at various points and the issues raised by the video were discussed with the researcher. The participant then identified two activities they would like

to do in the future that they have positive memories of doing in the past. The participant then recalled a memory of a time when they did the activity being discussed and the researcher supported this recall with prompts taken from previous autobiographical memory studies (Ricarte et al., 2012) and the Memflex intervention for autobiographical memory (Hitchcock et al., 2017). These prompts covered the following areas:

- Details – who/what/where/when
- Five senses – smell/taste/hear/see/touch
- Identity – what does this tell us about you as a person?
- Positive themes – what was good about this event for you?
- Generalisation of positive themes – does this link to other activities you have done? How?
- Future planning – what steps could you take to repeat this activity?

Control Condition: Basic Recall

In the control condition participants are not shown the psychoeducation video and do not receive additional prompts during the memory recall. Participants in this condition began by choosing two activities they have done previously that they would like to do again in the future. They then recalled a memory of doing each activity (with no prompts).

Study Procedure

Study 1: Cross-Sectional Study

The participant was given 24hrs to consider the information sheet prior to meeting with the researcher. The researcher then gave them time to consider the information and ask questions at the start of the meeting. Informed consent was then gained from the participant. The measures were completed in the order they are presented above. The session lasted between 1hr and 1.5hrs, some participants completed this in two parts, but the majority completed all the measures in one session.

Participants were then randomised (2:1 ratio) using the secure online program www.sealedenvelope.com.

Study 2: Intervention Pilot Study

Intervention Condition: Guided Recall

Participants completed the pre-intervention measure then watched the psychoeducation video. Guided recall took place following identification of an activity and linked memory. The post-intervention questionnaire was then completed. This protocol was repeated for the second activity (the video was not repeated) and participants then completed the feedback questionnaire.

Control Condition: Basic Recall

Participants completed the pre-intervention measure then identified an activity and linked memory. They recalled this memory with no additional prompts then completed the post-intervention questionnaire. This protocol was repeated for the second activity and then the feedback questionnaire was completed.

Analyses

Data Quality

All ratings were examined for normality using Shapiro-Wilks tests and visual inspection of Q-Q plots (Ghasemi & Zahediasl, 2012). Where normality was confirmed parametric tests were conducted. Variables not normally distributed were logarithmically transformed (Lg10) and normality analyses repeated. If data were still not normally distributed non-parametric tests were conducted on the non-transformed data. Data were examined for outliers that were over +/- 2 standard deviations from the mean. Analyses were repeated with these outlying data-points excluded (Tabachnick, 2013). The significance level threshold was set at $p = <0.05$. All tests conducted were 2-tailed (Field, 2009). Analyses were conducted in SPSS (Version 21) (SPSS Inc, 2012).

Demographic Data

The demographics of the participants are presented for both studies. The groups are compared on these variables using chi-squared tests for categorical variables e.g. ethnicity, and t-tests for continuous variables e.g. age. The mean and distribution of the scores on the scales used were also reported.

Cross- Sectional Study

Memory Ratings

The memories provided during the autobiographical memory test were rated both by the researcher and the participant. The ratings generated by the participants were compared between positive and negative memories using paired t-tests to establish the validity of the memories generated.

Correlational Analyses

Correlational analyses were conducted to test the hypothesised relationships between autobiographical memory specificity and negative symptoms, cognitive measures, depression, defeatist beliefs and functioning. If there was indication that confounding may be present, partial correlations were conducted with the indicated variables.

Intervention Study

Feasibility and Acceptability

This is a pilot study of a novel intervention and both eligibility of referrals to the study, consent rates and adherence rates were reported as a measure of feasibility. The categories of activities selected by participants were presented to provide an idea of the feasibility and focus of the sessions. The ratings of pleasantness and "realness" of the memories completed by participants after each recall were reported and compared between groups to ensure vivid positive memories were generated in both conditions and to examine the impact of additional prompts on the experience. To fully report the acceptability of this intervention each item on the feedback questionnaire completed by

participants was summarised and presented for both groups. Quotes from participants in response to open questions on the feedback questionnaire were reported.

Pilot Efficacy

This pilot study enabled exploratory analyses regarding whether state assessments of mood, motivation, anticipatory pleasure and self-efficacy were improved by the guided recall condition compared with the basic recall condition. These ratings were combined into pre- and post across the two activities. A between-group standardised effect size (Cohen's d) was calculated for each of these variables using the post-means for each group and the pooled, baseline standard deviation. The 95% confidence intervals for the effect sizes are reported.

Results

Study 1: Is there a relationship between autobiographical memory and negative symptoms in people with non-affective psychosis?

Sample

A total of 34 people with a diagnosis of non-affective psychosis took part in the study. Of these, 64.7% were inpatients at the time they took part in the study, including 6 in a rehabilitation ward and 14 in an acute ward setting. Thirty-two participants (94%) were currently prescribed antipsychotic medication, with 12 on depot injections. The full characteristics of the sample are described in Table 1 below.

The mean score on the BDI reflects a mild level of depression in the sample which replicates previous studies (Chemerinski et al., 2008). Verbal fluency scores are similar to those reported in other studies e.g. 44.76 (Joyce et al., 2009). Letter-number sequencing was slightly lower than previous studies (e.g. 9.18, SD = 2.55) suggesting poorer working memory on average in the sample (Horan et al., 2008). The CAINS total score was similar to those reported in other studies that focused on negative symptoms, although with slightly

higher experiential (e.g. 14.94, SD = 4.91) and lower expressive subscale totals (e.g. 4.91, SD = 3.19) (Painter & Kring, 2016; Strauss & Gold, 2016). Low positive symptom scores are also common in studies focused on negative symptoms e.g. (Edwards et al., 2015b; Forbes et al., 2010). The Time Use scores for both CEA and SA are significantly lower than in a recent large-scale study (CEA = 19.46, SA = 48.37) suggesting reduced functioning in this sample (Cella, Edwards, & Wykes, 2016). The defeatist performance beliefs score is elevated and in line with previous studies in this population e.g. 47.3 – 53.3 (Granholm, Holden, Link, McQuaid, & Jeste, 2013; Grant, Perivoliotis, Luther, Bredemeier, & Beck, 2017).

Table 1: Sample Characteristics (n = 34)

	Mean/Percentage	**Standard Deviation**	**Range**
Age	39.1	10.99	23-59
Gender (%M)	76.5		
Highest Education Level (%)	Primary: 2.9 Secondary: 35.3 Further: 38.2 Higher: 23.5		
Ethnicity (%)	White British: 17.6 Black British: 50.0 Black African: 17.6 Hispanic: 2.9 Black Caribbean: 8.8 White European: 2.9		
Primary Diagnosis (%)	Non-Organic Psychosis: 17.6 Schizoaffective Disorder: 17.6 Schizophrenia: 58.8 Delusional Disorder: 2.9 Organic Catatonic Disorder: 2.9		
BDI (Total)	14.65	13.78	0-52
Verbal Fluency (Total)	56.42	20.09	30-133

Letter-Number Sequencing	5.56	2.68	2-12
CAINS	Total: 21.94 Experiential (MAP): 18.62 Expressive: 3.32	7.05 5.93 2.75	5-38 5-30 0-8
SAPS	Total: 7.34 Hallucinations: 2.59 Delusions: 4.75	9.79 4.83 6.34	0-41 0-21 0-20
Time Use	Constructive Economic Activity: 7.01 Structured Activity: 23.32	7.43 16.50	0-24.05 1.8 – 74.38
Defeatist Performance Beliefs Subscale - Dysfunctional Attitudes Scale (Total)	51.56	16.72	21-93

Data Quality

All continuous variables included in further analyses were examined using a Shapiro-Wilks Test and examination of Q-Q plots. All questionnaire data were normally distributed. The verbal fluency test showed significant skewness due to one outlier who scored highly, repeating these analyses without this data point did not alter the conclusions below. The external memory ratings were normally distributed. The self-ratings of details for both positive and negative memories were skewed by two outliers (different for each memory type). Excluding these outliers and repeating the paired t-test conducted did not alter the conclusions below. Intensity and emotion ratings were normally distributed.

Do People with Non-Affective Psychosis Generate Valid Autobiographical Memories?

Participants were able to generate valid positive and negative memories. This is determined by positive memories being rated as containing more positive emotion than negative memories and vice versa for negative emotion (see Table 2). The positive and negative memories did not differ on the detail as rated by participants or interviewers. Participants' rated positive memories as significantly more intense than negative memories.

Table 2: Characteristics of Autobiographical Memories

	Negative Memory		Positive Memory		Comparison (paired t-test)	
	Mean	**SD**	**Mean**	**SD**	**t**	**p**
Negative Emotion (0-100)	67.80	30	20.47	27.01	-6.87	.000
Positive Emotion (0-100)	40.64	39.09	88.05	16.97	6.78	.000
Intensity (Sum of 2 ratings, 0-200)	119.55	60.24	141.42	53.50	-2.59	.01
Details (Sum of 7 ratings, 0-700)	409.28	146.99	453.35	137.25	1.41	.17
Interviewer Ratings (Sum of 5 ratings, 0-10)	5.76	2.19	5.71	2.35	.14	.89

Correlational Analyses

The correlational analyses showed that, in contrast to our hypotheses, depressive and negative symptoms did not correlate with the interviewer ratings of autobiographical memory. The one exception is expressive negative symptoms which was weakly correlated with negative memory ratings (see Table 3 below). Increased structured activity was moderately associated with reduced experiential negative symptoms and increased positive memory ratings. In line with our hypotheses, cognitive abilities correlated with memory ratings and functioning. Increased defeatist performance beliefs were weakly associated with a decrease in positive memory ratings but not symptomatology.

Table 3: Correlational Analyses

	Time Use CEA	Time Use SA	BDI	DPA-DAS	CAINS MAP	CAINS Expressive	Verbal Fluency	Letter Number Sequencing	Interviewer Rating Neg Memory	Interviewer Rating Pos Memory
Time Use CEA		**.63****	-.08	-.07	.08	.01	**.51****	**.36****	-.10	-.17
Time Use SA	**.63****		.02	-.13	**-.44***	-.01	**.62****	.05	.08	**.42***
BDI	-.08	.02		.22	.09	.04	.23	.17	.10	.20
DPA-DAS	-.07	-.13	.22		.28	.17	-.17	-.24	-.21	**-.37***
CAINS MAP	.08	**-.44***	.09	.28		.21	-.33	-.32	-.16	-.28
CAINS Expressive	.01	-.01	.04	.17	.21		-.34	-.22	**-.36***	-.14
Verbal Fluency	.18	**.62****	.23	.17	-.33	-.34		**.48****	.33	.30
Letter Number Sequencing	-.08	.05	.17	-.24	-.32	-.22	**.48****		**.48****	**.46****
Interviewer Rating Neg Memory	-.10	.08	.10	-.21	-.16	**-.36***	.33	**.48****		**.38***
Interviewer Rating Pos Memory	-.17	**.42***	.20	**-.37***	-.28	-.14	.30	**.46****	**.38***	

* = p<.05, ** = p<.0. AMT-I = Interviewer AMT ratings.

Study 2: Acceptability and Feasibility of a Brief Autobiographical Memory Intervention for Low Motivation in Psychosis

Sample

The total recruited was 34 participants who were randomised in a ratio of 2:1 to a guided recall or basic recall condition. A total of 21 people completed the guided recall condition of the study (3 lost to follow up), A total of 10 people completed the basic recall condition of the study (0 lost to follow up). The full characteristics of the two samples are described in Table 4 below. There were no significant differences between the groups except for negative symptoms, which were higher in the guided recall condition.

Table 4: Characteristics of Guided Recall and Basic Recall Conditions

	Guided Recall Condition (n = 21)	**Basic Recall Condition (n = 10)**
Mean Age (SD)	38.62 (10.98)	41.10 (9.09)
Gender (%M)	76.2	80
Highest Education Level (%)	Primary: 0 Secondary: 42.9 Further: 38.1 Higher: 19	Primary: 0 Secondary: 20 Further: 40 Higher: 40
Ethnicity (%)	White British: 9.5 Black British: 61.9 Black African: 19 Hispanic: 0 Black Caribbean: 9.5 White European: 0	White British: 30 Black British: 40 Black African: 0 Hispanic: 10 Black Caribbean: 10 White European: 10
Primary Diagnosis (%)	Non-Organic Psychosis: 14.3 Schizoaffective Disorder: 14.3 Schizophrenia: 61.9 Delusional Disorder: 4.8 Organic Catatonic Disorder: 4.8	Non-Organic Psychosis: 20 Schizoaffective Disorder: 20.0 Schizophrenia: 60.0 Delusional Disorder: 0 Organic Catatonic Disorder: 0
BDI Total	13.19 (11.73)	16.90 (17.18)

Verbal Fluency Total	53.05 (15.07)	61.80 (28.81)
Letter-Number Sequencing Total	5.10 (2.81)	6.44 (2.55)
CAINS Total	24.1 (6.37)	17.1 (6.82)
SAPS Total	6.95 (10.20)	9.60 (10.21)
Time Use Structured Activity	23.52 (25.40)	31.81 (24.98)

Acceptability and Feasibility

Referrals

41 people were referred to the study, 2 of these people were not eligible as they had a diagnosis of Bipolar Affective Disorder. Of the remaining 39 people, 4 people did not consent to take part when approached, the remaining 35 people (90%) provided informed consent to take part in the study.

Were participants adherent to the guided recall intervention?

All participants except for 2 took part in the complete session which lasted 40mins – 1 hour. These included one participant in the guided recall condition who declined to watch the video and was not able to give a reason for this but completed both memory exercises. The other participant who was not able to complete the enhanced recall session was not able to concentrate adequately on the video and only completed one memory exercise, he attributed this to sedative effects of a recent medication increase.

Were participants able to select appropriate activities for the session?

Participants in both conditions selected a wide range of activities, which have been summarised in Table 5 below. Examples of hobbies identified more than once include: listening to music, reading, going to the cinema, visiting art galleries, travelling or eating out.

Table 5: Activity Selection in Both Conditions

Activity Type	Activity 1 N (%)	Activity 2 N (%)
Creative	1 (3.3)	2 (6.9)
Employment	4 (13.3)	0
Education	1 (3.3)	3 (10.3)
Exercise	8 (26.7)	8 (27.6)
Social	6 (20.0)	1 (3.4)
Hobbies	10 (33.3)	15 (51.7)

Were participants able to generate positive memories linked to those activities?

It was demonstrated in the findings of Study 1 that the participants were able to generate valid positive autobiographical memories. The additional requirement of linking these to activities was met by the participants and the "pleasantness" ratings below demonstrate that these memories were also positive. Participants rated memories in both conditions highly on a scale which asked them how "real" they felt during the recall. There were no significant differences in the ratings of either pleasantness or "realness" in the two conditions but pleasantness is elevated in the guided recall condition.

Table 6: Pleasantness and Vividness Ratings After Memory 1 and Memory 2 in Both Groups

	Guided Recall Condition	Basic Recall Condition	Comparison (t)
Memory 1 Post-Pleasant (-10 - 10)	6.70 (4.15)	6 (4.44)	.42
Memory 1 Post-Real (0-100)	78.97 (23.74)	80.27 (25.24)	-.14
Memory 2 Post- Pleasant (-10 – 10)	6.95 (3.98)	5.81 (4.32)	.71
Memory 2 Post- Real (0-100)	82.51 (20.48)	81.79 (19.30)	.09

Did participants find the interventions acceptable?

Participants across both conditions rated the interventions as highly acceptable (>80%). These ratings were not significantly different between groups suggesting that participants found the basic recall condition sufficient to learn something from the session and find it helpful.

Table 7: Summary of Items on Feedback Questionnaire in Both Groups

Acceptability Item	**Guided Recall Condition**	**Basic Recall Condition**	**t statistic**
Helpful (0-100)	82.80 (17.37)	83.78 (20.46)	-0.14
Easy (0-100)	83.84 (19.42)	86.16 (17.12)	-0.32
Learned Something (0-100)	86.13 (16.05)	87.28 (16.67)	-0.18
Relevant (0-100)	77.45 (18.92)	82.16 (19.64)	-0.64
Recommend to Others (0-100)	79.56 (20.64)	83.90 (20.49)	-0.55
Take Part in Something Similar (0-100)	83.31 (17.73)	86.04 (17.12)	-0.402

What did participants say about the intervention?

The participants in both conditions provided a lot of feedback regarding their experience of taking part in the sessions. Ideas that were reported as helpful by participants were practicing recall of happy memories and the link between memory and motivation. Some suggestions for improvements included ensuring a calm environment, perhaps adding some music to enhance this and more memory tasks.

Table 8: Summary of Qualitative Feedback Provided

Guided Recall Condition	Basic Recall Condition
What was most helpful about the session?	
Focusing on decision-making, overcoming negativity. Narrators in the video were helpful.	*recounting my memories*
Gaining new perspective on how memories and actions are interlinked. Freedom in recalling sesnsations and feelings for application in everyday life.	*Remembering that I need to pay more attention to things*
Having someone to talk to about my experiences	*Scales of percentage. Completing them twice. Talking about them.*
It made me think about positive activities that help my general wellbeing and attitude	*The fact that we talked about doing things*
It was a way of looking into certain areas that enabled me to appreciate life events, make changes, think more in depth about them and to learn	*The idea that memories can boost motivation and reminding myself of happier times*
Jogged my memory and had some pleasant feelings thinking about good times in the past that can happen again	*The memory task, i.e. thinking about things unusual to me*
Learning new things and skills	*Thinking of memories*
Makes me open up, remembered things I forgot to tell care co-ordinator	
Remind - compromise in the futue. Something to keep and work at for the future.	
Talking about the gallery. The video was good - other people with low confidence - it's not just me	
Talking and expressing my feelings	
Talking to [Researcher]. Motivation	
To remember events from the past	
Video	
What was least helpful about the session?	
Medication sometimes interfered. In comparison to if I weren't on them (few pains)	*More memory related games could be fun and boost confident and intellect*
Remember sad times	*No space to write down details.*
Still images of a person with the images above their head - couldn't see very well - no glasses. More	*thinking about a negative thought*

narration	
	Time taken
Will you continue using anything from the session?	
Ask about pool, try and find other things I can go with the flow. Go to art gallery.	*Build from the memories of talking about my activities*
Making more memorable moments.	*No*
The way pleasant memories can lead to positive attitudes towards life	*recalling happier times to help motivate and build happiness*
Think about my career in the computers	*remain positive about the experience*
try to recognise, the good things in my life, rather than being depressed.	*Yes*
Yeah	*Yes, I will*
YES I will	
YES memory disadvantage of good and bad memories.	
Is there anything you would change about the session?	
Not really it's natural	*More memory related tasks and games. maybe some meditation/mindfulness on happy memories.*
Not sure	*To see first ratings from the first time.*
nothing	
Nothing	
Nothing really	
Calming background music, quieter environment, providing less distraction from tasks at hand.	
Any other comments?	
Repetition is helpful.	*I hope the research goes well.*
The session has been helpful	*I would be happy to attend another study.*
	I would like the memory task to be done in the second session so that I can see how my memory has improved
	It was very pleasant

Preliminary Estimates of the Efficacy of Pilot Intervention

As the intervention was repeated for two activities during the session the pre- and post-ratings (negative mood, positive mood, motivation, self-efficacy and anticipatory pleasure) were combined across the two memories. The mean values and effect sizes for each variable at the pre- and post- time points in each group are reported in Table 9 below. The mean value for the basic group was subtracted from the guided group and therefore a positive value indicates greater improvement in the condition with more prompts. The exception is negative mood where a negative value would indicate the negative mood had been reduced further in the guided group. These standardised effect sizes indicate effects in the expected directions for motivation, self-efficacy and negative mood – although these are small-moderate with wide confidence intervals. The effect size for anticipatory pleasure does not signal a clear direction for this effect and whilst the descriptive data indicate increased and stable positive mood in the guided and basic groups respectively, the effect size is in the opposite direction to anticipated, given the guided group rating substantially lower in positive mood at baseline.

Table 9: Pre- and Post-Means for Both Groups

Measure	Group	Time	Mean	Std. Error	95% Confidence Interval		Cohen's d (95% CIs)
					Lower Bound	Upper Bound	
Motivation (0-100)	Guided	Pre	77.53	4.16	69.21	85.86	0.32 (-.21, .86)
		Post	81.01	4.15	72.80	89.40	
	Basic	Pre	76.75	5.81	65.12	88.38	
		Post	72.89	5.79	61.30	84.49	
Anticipatory Pleasure (0-100)	Guided	Pre	85.94	3.29	79.34	92.54	-.05 (-.59, .48)
		Post	84.35	3.05	78.23	90.47	
	Basic	Pre	82.40	5.14	72.09	92.70	
		Post	86.58	4.76	77.03	96.13	
Self-Efficacy (0-100)	Guided	Pre	73.06	4.20	64.64	81.49	.19 (-.34, .73)
		Post	74.07	4.27	65.50	82.64	
	Basic	Pre	73.50	6.56	60.34	86.65	
		Post	70.85	6.67	57.47	84.23	
Positive Mood (0-300)	Guided	Pre	161.26	9.04	143.04	179.49	-.34 (-.91, .24)
		Post	178.95	8.50	161.80	196.10	
	Basic	Pre	202.12	16.33	167.32	236.93	
		Post	198.11	15.46	165.15	231.07	
Negative Mood (0-400)	Guided	Pre	131.89	12.18	107.33	156.45	.20 (-.36, .76)
		Post	116.62	11.76	92.90	140.34	
	Basic	Pre	123.58	23.26	74.00	173.16	
		Post	105.66	26.05	50.14	161.18	

Discussion

Summary of Key Findings

The results of the autobiographical memory task in Study 1 showed that people with non-affective psychosis were able to generate valid positive and negative autobiographical memories with the expected emotional ratings. There was no evidence of over-general memory for either category. Positive memories were rated as a more intense emotional experience than negative memories.

Our hypotheses that negative and depressive symptoms would be associated with autobiographical memory ratings were not supported. The one exception was for expressive negative symptoms which were associated with less detailed negative memories only. As expected, working memory performance was linked to less detailed negative and positive memories, this was not the case for verbal fluency. More detailed positive memories were associated with fewer self-defeatist beliefs and increased structured activity.

Participants were able to complete the intervention sessions as planned in Study 2 and identified appropriate activities to discuss, with hobbies and exercise the most common categories. Similarly, to Study 1, participants were able to generate memories linked to these activities that they rated as having high levels of positive emotion, this was the same for both groups. Participants overwhelmingly rated both conditions as acceptable and helpful with the feedback suggesting that participants found the concept of link between memory and motivation relevant and helpful. There was no evidence of an anticipatory pleasure deficit, with both groups reporting high levels at the start of the session. The findings are encouraging for future interventions using guided autobiographical memory retrieval with effects in the expected direction for motivation, self-efficacy and a reduction in negative mood.

Study 1: Cross-Sectional Findings

Autobiographical memory specificity does not appear to be linked consistently to negative or depressive symptoms in psychosis, with the null finding from this study adding to mixed findings in the wider literature (Berna, Potheegadoo, et al., 2016). This may be due to high variation in measurement of all three constructs; negative symptoms, depressive symptoms and memory specificity. However, it could also represent the heterogeneity which is emerging across the presentation of negative and depressive symptoms in people with psychosis. This may mean that autobiographical memory is linked to these symptom dimensions in certain subgroups which are yet to be identified consistently. An important finding is that expressive symptoms seem to limit the ability to generate rich negative memories only. Due to the cross-sectional nature of this study it is not clear in which direction this association may occur. Over-general negative memory can contribute to low mood as has been documented in the depression literature (Williams et al., 2007). However, people who have vague memories for negative events may also express less emotion in general and this could contribute to high levels of expressive negative symptoms. It is also important to note that the failure to confirm our hypothesis regarding the link between experiential negative symptoms and autobiographical memory limits the use of the causal-interventionist approach. However, the links found between positive autobiographical memories and both lower functioning and self-efficacy beliefs provide support for exploring an intervention targeting this area.

As has been documented in other studies (Painter & Kring, 2016) this study found that people with psychosis generate high levels of positive and negative emotion and can do so appropriately for memories as well as “in the moment” stimuli (Yan et al., 2012). Positive memories were rated as more intense than negative memories and this perhaps might explain

why expressive deficits were linked to negative memory ratings only. If positive memories are more intense as rated by the individual, then the interviewer ratings are perhaps less likely to be limited by expressive deficits. Only positive memories were associated with functioning, those individuals with richer positive autobiographical memories reported doing more "Structured Activity" and endorsed fewer self-defeatist beliefs. Again, the cross-sectional design does not allow us to establish the direction of this association. It may be that richer positive memories enable the individual to engage in more activity and provide evidence to support self-efficacy beliefs. Alternatively, individuals who are doing more could be having more positive experiences and therefore find these memories easier to access in detail. People with fewer defeatist beliefs might also find it easier to see the value in activities they have engaged with in the past and therefore report them in more detail. These hypotheses all fit with a cognitive perspective which proposes that low expectations (social rejection, stigma and performance) contribute to negative symptoms (Conway & Pleydell-Pearce, 2000; Rector, Beck, & Stolar, 2005). Studies with a longitudinal or experimental design which disentangle the direction of this association are needed.

The findings from Study 1 present some initial evidence to add to this growing field which suggests that rich autobiographical memories are available as a therapeutic target in people with non-affective psychosis. This adds to the substantial body of evidence that people with psychosis have intense emotional experiences despite expressive deficits. There is some suggestion that targeting positive memories may positively impact on functioning and reduce unhelpful self-defeatist cognitions which are associated with negative symptoms (Campellone et al., 2016) but further research with a design that enables directional analyses is needed.

Study 2: Feasibility and Acceptability of a Pilot Intervention

The people who were referred to the study met the eligibility criteria, however inclusion of people with Bipolar Disorder could be considered in future research. The high rates of people who completed Study 2, in both guided and basic recall conditions, suggests memory interventions are feasible to deliver in this population. The findings regarding the engagement in the session show that people with psychosis can engage successfully in an intervention which targets autobiographical memory linked to positive activities and their future goals. Participants in both a basic and guided recall condition found this an acceptable intervention to take part in and provided positive feedback.

The positive signals for self-efficacy and motivation are encouraging for future interventions in the field of negative symptoms. This replicates findings from a study using additional prompts to support work on a cognitive task – participants in the guided condition endorsed fewer self-defeatist beliefs following the intervention (Grant et al., 2017). Follow-up as to how this impacts on engaging with activity is important to establish the real-world significance of this finding. To add to the current debate in the field, there was no evidence of an anticipatory pleasure deficit with both groups rating this highly at the start of the session. Anticipatory pleasure did not appear to be a useful outcome in this intervention with the signal showing no clear direction of effect. This is perhaps unsurprising in a field with very mixed outcomes regarding anticipatory pleasure (Edwards et al., 2015a). Motivation and self-efficacy may be more useful outcomes to focus on in future clinical research.

It is important to note that positive mood does increase in the guided group, and both groups retrieved positive autobiographical memories as part of the intervention received – supporting further investigation of this technique in therapeutic work. Negative mood did show an effect in the intended direction which suggests additional prompts may aid individuals to focus away

from negative emotions they may be experiencing. A larger and wider evaluation of this intervention is required to establish the whether these signals manifest as meaningful change but are a promising start.

Limitations

The wider conclusions that can be drawn from both studies are limited by the size of the sample, although in the pilot intervention study encouraging signals were detected in the data and useful feedback was received. The sample had lower working memory scores and functioning levels than studies focusing on similar research questions, perhaps due to the high number of inpatient participants. However, the inclusion of these participants improved the generalisability compared to other studies. The lack of a non-clinical control sample prevents definitive conclusions to be drawn from Study 1 regarding autobiographical memory deficits in people with non-affective psychosis and within-group analyses were conducted.

The scores in the intervention study, particularly for motivation, self-efficacy and anticipatory pleasure, were high for many participants at the pre-intervention stage. This left little room for movement on these scales, particularly improvement, and perhaps could be differently operationalised to try to manage this. However, the consistency across participants suggests this may be a feature of responding in this group and additional scales may be needed to detect meaningful changes. It is important to note that the guided recall condition had higher levels of negative symptoms prior to the intervention and this may have impacted on the findings. The intervention study took place in one session and there was no follow-up to assess the impact on functioning or the activities discussed – this would be important to include in a future study of this intervention approach.

Clinical Implications

This study adds support to the importance of using negative symptom measures which report expressive and experiential subscales (Messinger et al., 2011). These scales capture important heterogeneity in people with non-affective psychosis and, as in this study, the two clusters of symptoms relate differently to other constructs. This project, as discussed previously, adds important evidence to the existing body which demonstrates intact emotional experience in people with psychosis (Yan et al., 2012). This does not support the construct of "anhedonia" as described in depression existing in this group. There was also no evidence for the anticipatory pleasure deficit hypothesis in the ratings provided in the intervention study. Clinicians can rely on the emotional experience of people with psychosis and should highlight this and use it in interventions provided. Clinicians can also be confident in using autobiographical memories in their clinical work – these can be generated be people with psychosis along with the expected emotional experiences. The participants found the link between their memories and their future goals a useful idea to consider in the intervention and were able to engage with these ideas successfully. Initial signs for using additional memory prompts are encouraging and clinicians, across disciplines, could consider incorporating this brief intervention into their approach when working towards goal-setting and increasing activity.

This study has contributed to our understanding of the role of autobiographical memory in the difficulties experienced by people with psychosis. It is not the same link as in depression as the same relationship with these symptoms is not consistently present. Instead, links between autobiographical memory and expressive symptoms, functioning and self-defeatist beliefs may be relevant for future clinical research. Interventions targeting negative symptoms are in the early stages of development and this study has highlighted that guided recall of positive memories – linked to the individual's future goals – is a promising approach in this field.

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Appendix

HRA Approval Letter

Health Research Authority

Dr Clementine Edwards
Trainee Clinical Psychologist

South London & Maudsley NHS Trust
3rd Floor, Addiction Sciences Building, Institute of Psychiatry,
Psychology & Neuroscience
4 Windsor Walk
London
SE5 8AF

03 March 2017

Dear Dr Edwards

Letter of HRA Approval

Study title:	Is there a Relationship between Memory for Past Events and Motivation for Future Activities?
IRAS project ID:	214063
REC reference:	17/LO/0009
Sponsor	Kings College London

I am pleased to confirm that **HRA Approval** has been given for the above referenced study, on the basis described in the application form, protocol, supporting documentation and any clarifications noted in this letter.

Participation of NHS Organisations in England

The sponsor should now provide a copy of this letter to all participating NHS organisations in England.

Appendix B provides important information for sponsors and participating NHS organisations in England for arranging and confirming capacity and capability. **Please read *Appendix B* carefully**, in particular the following sections:

- *Participating NHS organisations in England* – this clarifies the types of participating organisations in the study and whether or not all organisations will be undertaking the same activities
- *Confirmation of capacity and capability* - this confirms whether or not each type of participating NHS organisation in England is expected to give formal confirmation of capacity and capability. Where formal confirmation is not expected, the section also provides details on the time limit given to participating organisations to opt out of the study, or request additional time, before their participation is assumed.
- *Allocation of responsibilities and rights are agreed and documented (4.1 of HRA assessment criteria)* - this provides detail on the form of agreement to be used in the study to confirm capacity and capability, where applicable.

Further information on funding, HR processes, and compliance with HRA criteria and standards is also provided.

It is critical that you involve both the research management function (e.g. R&D office) supporting each organisation and the local research team (where there is one) in setting up your study. Contact details and further information about working with the research management function for each organisation can be accessed from www.hra.nhs.uk/hra-approval.

Appendices

The HRA Approval letter contains the following appendices:

- A – List of documents reviewed during HRA assessment
- B – Summary of HRA assessment

After HRA Approval

The document *"After Ethical Review – guidance for sponsors and investigators"*, issued with your REC favourable opinion, gives detailed guidance on reporting expectations for studies, including:

- Registration of research
- Notifying amendments

- Notifying the end of the study

The HRA website also provides guidance on these topics, and is updated in the light of changes in reporting expectations or procedures.

In addition to the guidance in the above, please note the following:

- HRA Approval applies for the duration of your REC favourable opinion, unless otherwise notified in writing by the HRA.
- Substantial amendments should be submitted directly to the Research Ethics Committee, as detailed in the *After Ethical Review* document. Non-substantial amendments should be submitted for review by the HRA using the form provided on the HRA website, and emailed to hra.amendments@nhs.net.
- The HRA will categorise amendments (substantial and non-substantial) and issue confirmation of continued HRA Approval. Further details can be found on the HRA website.

Scope

HRA Approval provides an approval for research involving patients or staff in NHS organisations in England.

If your study involves NHS organisations in other countries in the UK, please contact the relevant national coordinating functions for support and advice. Further information can be found at http://www.hra.nhs.uk/resources/applying-for-reviews/nhs-hsc-rd-review/.

If there are participating non-NHS organisations, local agreement should be obtained in accordance with the procedures of the local participating non-NHS organisation.

User Feedback

The Health Research Authority is continually striving to provide a high quality service to all applicants and sponsors. You are invited to give your view of the service you have received and the application procedure. If you wish to make your views known please email the HRA at hra.approval@nhs.net. Additionally, one of our staff would be happy to call and discuss your experience of HRA Approval.

HRA Training

We are pleased to welcome researchers and research management staff at our training days – see details at http://www.hra.nhs.uk/hra-training/

Your IRAS project ID is **214063**. Please quote this on all correspondence.

Yours sincerely

Miss Helen Penistone

Assessor

Email: hra.approval@nhs.net

Copy to: *Mr Keith Brennan*

Ms Jennifer Liebscher, South London and Maudsley NHS Trust

Appendix A - List of Documents

The final document set assessed and approved by HRA Approval is listed below.

Document	*Version*	*Date*
Copies of advertisement materials for research participants [Recruitment Poster]	2	03 February 2017
Covering letter on headed paper [Response to REC Cover Letter]	2	03 March 2017
Evidence of Sponsor insurance or indemnity (non NHS Sponsors only) [KCL Insurance Document]		07 June 2016
IRAS Application Form [IRAS_Form_28112016]		28 November 2016
IRAS Checklist XML [Checklist_28112016]		28 November 2016
Letter from sponsor [Confirmation of KCL/SLaM Sponsorship]		16 November 2016
Non-validated questionnaire [Intervention Feedback Questionnaire]	1	25 November 2016
Non-validated questionnaire [Pre-Post Intervention Questionnaire]	1	25 November 2016
Participant consent form [Participant Consent Form]	7	02 March 2017
Participant information sheet (PIS) [Participant Information Sheet]	7	02 March 2017
Referee's report or other scientific critique report [Reviewer's Report]	1	02 August 2016
Referee's report or other scientific critique report [Clinical Academic Group Approval]		07 September 2016
Research protocol or project proposal [Study Protocol]	4	14 November 2016
Summary CV for Chief Investigator (CI) [Clementine Edwards CV]	1	18 November 2016
Summary CV for student [Clementine Edwards CV]	1	18 November 2016
Summary CV for supervisor (student research) [Amy Hardy CV]	1	18 November 2016
Summary CV for supervisor (student research) [Philippa Garety CV]		

Summary, synopsis or diagram (flowchart) of protocol in non technical language [Study Flowchart]	1	14 November 2016
Validated questionnaire [Beck Depression Inventory]	1	18 November 2016
Validated questionnaire [Clinical Assessment Interview for Negative Symptoms]		
Validated questionnaire [Dysfunctional Attitudes Scale- Defeatist Performance Beliefs]	1	18 November 2016
Validated questionnaire [Scale for the Assessment of Positive Symptoms]	1	27 December 2007
Validated questionnaire [Time Use Interview]	1	18 November 2016
Validated questionnaire [Letter- Number Sequencing]	1	21 November 2016
Validated questionnaire [Verbal Fluency Test]	1	25 November 2016
Validated questionnaire [AMT Questionnaire]	1	25 November 2016

Appendix B - Summary of HRA Assessment

This appendix provides assurance to you, the sponsor and the NHS in England that the study, as reviewed for HRA Approval, is compliant with relevant standards. It also provides information and clarification, where appropriate, to participating NHS organisations in England to assist in assessing and arranging capacity and capability.

For information on how the sponsor should be working with participating NHS organisations in

England, please refer to the, *participating NHS organisations*, *capacity and capability* and *Allocation of responsibilities and rights are agreed and documented (4.1 of HRA assessment criteria)* sections in this appendix.

The following person is the sponsor contact for the purpose of addressing participating organisation questions relating to the study:

Name: Dr Edwards

Tel: 07863 396985

Email: clementine.edwards@kcl.ac.uk

HRA assessment criteria

Section	HRA Assessment Criteria	Compliant with Standards	Comments
1.1	IRAS application completed correctly	Yes	No comments
2.1	Participant information/consent documents and consent process	Yes	No comments

3.1	Protocol assessment	Yes	No comments
4.1	Allocation of responsibilities and rights are agreed and documented	Yes	This is a single site study taking place in the NHS where the single site is also a co-sponsor. The single NHS site has advised that they do not require a Statement of Activities to be completed.
4.2	Insurance/indemnity arrangements assessed	Yes	Where applicable, independent contractors (e.g. General Practitioners) should ensure that the professional indemnity provided by their medical
Section	HRA Assessment Criteria	Compliant with Standards	Comments
			defence organisation covers the activities expected of them for this research study Question A77 was incorrectly completed. King's College London does not have arrangements in place to provide compensation where no legal liability arises for this study.
4.3	Financial arrangements assessed	Yes	The KCL Doctorate in Clinical Psychology Programme will provide funding to support this study.
5.1	Compliance with the Data Protection Act and data security issues assessed	Yes	No comments
5.2	CTIMPS – Arrangements for compliance with the Clinical Trials Regulations assessed	Not Applicable	No comments
5.3	Compliance with any applicable laws or regulations	Yes	No comments

6.1	NHS Research Ethics Committee favourable opinion received for applicable studies	Yes	No comments
6.2	CTIMPS – Clinical Trials Authorisation (CTA) letter received	Not Applicable	No comments
6.3	Devices – MHRA notice of no objection received	Not Applicable	No comments
6.4	Other regulatory approvals and authorisations received	Not Applicable	No comments

Participating NHS Organisations in England

This provides detail on the types of participating NHS organisations in the study and a statement as to whether the activities at all organisations are the same or different.

This study will involve a single NHS organisation where research activities will take place as per protocol.

If this study is subsequently extended to other NHS organisation(s) in England, an amendment should be submitted to the HRA, with a Statement of Activities and Schedule of Events for the newly participating NHS organisation(s) in England.

The Chief Investigator or sponsor should share relevant study documents with participating NHS organisations in England in order to put arrangements in place to deliver the study. The documents should be sent to both the local study team, where applicable, and the office providing the research management function at the participating organisation. For NIHR CRN Portfolio studies, the Local LCRN contact should also be copied into this correspondence. For further guidance on working with participating NHS organisations please see the HRA website.

If chief investigators, sponsors or principal investigators are asked to complete site level forms for participating NHS organisations in England which are not provided in IRAS or on the HRA website, the chief investigator, sponsor or principal investigator should notify the HRA immediately at hra.approval@nhs.net. The HRA will work with these organisations to achieve a consistent approach to information provision.

Confirmation of Capacity and Capability

This describes whether formal confirmation of capacity and capability is expected from participating NHS organisations in England.

This is a single site study co-sponsored by the site. The R&D office will confirm to the CI when the study can start.

Principal Investigator Suitability

This confirms whether the sponsor position on whether a PI, LC or neither should be in place is correct for each type of participating NHS organisation in England and the minimum expectations for education, training and experience that PIs should meet (where applicable).

A local collaborator would be needed at site to facilitate the access of externally employed researchers.

The sponsor should confirm to site any training expectations that they have.

GCP training is not a generic training expectation, in line with the HRA statement on training expectations.

HR Good Practice Resource Pack Expectations

This confirms the HR Good Practice Resource Pack expectations for the study and the pre-engagement checks that should and should not be undertaken

A researcher requiring access to the NHS site to carry out the research activities, who does not have an existing contractual arrangement, would be expected to obtain a Letter of Access. This would be based on standard DBS checks and occupational health clearance.

Other Information to Aid Study Set-up

This details any other information that may be helpful to sponsors and participating NHS organisations in England to aid study set-up.

The applicant has indicated that they do not intend to apply for inclusion on the NIHR CRN Portfolio.

South London and Maudsley NHS
NHS Foundation Trust

KING'S College LONDON

Is there a Relationship between Memory for Past Events and Motivation for Future Activities?

PARTICIPANT INFORMATION SHEET

You are being invited to take part in a research project. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully. Talk to others about the project if you wish.

Ask a member of the research team if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

Summary

- This project is for people with a diagnosis of psychosis who find it difficult to get motivated or have the energy to do things in life.
- The aim of the project is to investigate whether problems with memory for past events are linked to difficulties with motivation, and whether completing a memory task impacts on people's motivation to do things in the future.
- The project involves 2 parts. In the first part, you will be asked to remember two events from your past and will be supported to answer questions about difficulties you may be experiencing.

- In the second part a third of people will recall memories in the same way as the first part of the project. The remaining two thirds will be given additional support in recollecting these memories to see if this has any impact on motivation.

- Whether you get the additional support with recalling memories will be decided randomly by a computer, like tossing a coin.

- Your usual care will not be affected whether or not you decide to take part.

What is the aim of the project?

Difficulties with motivation (or feeling willing and able to do things) are common. This has a negative effect on people's lives, as they may not do the things they want. Research suggests that people under the care of mental health services view improving these difficulties as an important part of their recovery. However, no existing therapies have been shown to be effective in helping with motivation problems alongside psychosis, and psychological interventions need to be developed.

Research suggests that memories of past events may impact on our motivation to do things in the future. However, we do not fully understand how recalling the past impacts on motivation. This project aims to find out how remembering previous events is related to people's difficulties, and whether a task supporting memory recollections has any impact on motivation. It is anticipated that the findings of this project may help in developing new therapies for people who are experiencing difficulties with motivation.

Who can take part?

This project is for people with a diagnosis of psychosis who are experiencing problems with enjoying activities, low motivation and low energy levels. The researcher will discuss these things with you when you first meet to see if you are suitable to take part.

Do I have to take part?

No. It is up to you to decide whether or not to take part. If you do, you will be given this information sheet to keep and be asked to sign a consent form. You are still free to withdraw at any time and without giving a reason. A decision to withdraw at any time, or a decision not to take part, will not affect the care you receive.

What will happen if I take part?

You will be asked to complete a memory task. This memory task will involve you recalling two memories from your past, you will be able to choose the ones you share and we will audio record what you describe. These recordings will be anonymised and will be listened to only by other members of the research team. The memory task should take no more than 45mins.

During the session we will also support you to answer some questions about yourself including how you spend your time, your mood and whether you have certain types of

experiences. The entire session will last approximately 2 hours; this can be broken down into more sessions if this is more convenient for you.

The second stage of the project is shorter, and should only last for 1 hour at the most. It is entirely up to you whether you wish to do the second part of the project and you will be asked if you would like to at the end of the first part of the project. If you decide you do want to take part the researcher will consider with you the most convenient time to schedule this session. This second part should take place within 4 weeks of the first stage of the project. If you only wish to take part in the first stage of the project your participation will end at this point.

If you decide to take part, you will be randomly allocated to take part in one of two pathways. Everyone will be asked to recall two positive memories about an activity that could happen again (e.g. going shopping, seeing a friend). In one pathway this will be done the same way as in the first part of the project, and in the other additional support will be given when recalling the memory. You will then be asked some questions about how you feel about the activities, before and after recalling the memories. We can then compare the two groups to see if the additional support had any impact on motivation.

Expenses and Payments

If you decide to participate in the first half of this project you will receive a reimbursement of £15 for your time. For the second stage of the project, you will receive an additional reimbursement of £10 for your time. These can be provided as vouchers if that is preferable to you.

Unfortunately travel expenses cannot be provided in the funding of this project, however if this is a barrier to your participation the researcher will try to meet you somewhere that minimises the cost of travel.

What are the possible benefits of taking part?

This research hopes to develop our understanding of how we can best support people who are experiencing reduced pleasure and motivation. This will hopefully contribute to the development of new therapies to improve people's quality of life. There will be no immediate benefits from taking part but there will hopefully be long-term benefits for individuals with similar difficulties.

What will happen if I don't want to carry on with the project?

The decision about whether to take part in the project is entirely your own. You can decide not to take part or withdraw from the project at any time, without having to give a reason, and this will not affect your care in any way.

If you do decide to withdraw, we will keep the data we have already collected from you, but you will not have to take part further in the project. You can also request for any data collected to be destroyed. The same will apply if for any reason you are no longer able to make an informed decision about taking part, for example if your mental health gets worse.

What if there is a problem?

If you have a concern about any aspect of this project, you should ask to speak with the researcher who will do their best to answer your questions or you can talk to the project supervisor Dr Amy Hardy (0207 848 5178). If you become distressed or unwell at any point during the project then the session will stop and any data collected up until that point will be used in the analysis.

Should you wish to make a formal complaint the contact details are as follows:

Dr Gill Dale, Director of Research Quality;

Head, Joint R&D Office of South London and Maudsley NHS Foundation Trust and Institute of Psychiatry, Psychology & Neuroscience (IoPPN),

POO5, Institute of Psychiatry, Psychology & Neuroscience (IoPPN),
King's College London, De Crespigny Park, London SE5 8AF

gill.dale@kcl.ac.uk.

Will my taking part in this project be kept confidential?

If you join the project, some parts of your medical records and the data collected for the project will be looked at by members of the research team, who will be authorised persons from the Institute of Psychiatry, Psychology & Neuroscience. They will have a duty of confidentiality to you as a research participant and nothing that could reveal your identity will be disclosed outside the research site.

All information which is collected about you during the course of the research will be kept strictly confidential. At the beginning of the project, you will be allocated a number which will be used to identify all information we keep about you. Your name and address and will be kept in a separate place so that it will not be possible to identify any data stored about you. All data will be collected directly from you or from your case notes. Only researchers involved in the project will have access to this data, although they will tell your care team that you are taking part in the project so they can support you with your participation. In accordance with safeguarding procedures, they will also inform your care team should there be any concern that you may pose a risk to yourself or others. The data will be stored for 7 years and then disposed of securely.

The procedures for handling, processing, storage and destruction of their data are compliant with the Data Protection Act 1998.

What will happen to the results of the research project?

When the project is completed, the results will be written up for publication in academic journals and will be presented at scientific conferences. We will also produce a newsletter summarising the findings of the project which we will send to you and your clinical team. You will not be identified in any report or publication.

Who is organising and funding the research?

The project is organised by the Institute of Psychiatry, Psychology & Neuroscience, King's College London. It is part of a Doctoral thesis in Clinical Psychology.

Who has reviewed the project?

All research in the NHS is looked at by an independent group of people, called a Research Ethics Committee, to protect your interests. This study has been reviewed and given favourable opinion by Camberwell St Giles Research Ethics Committee.

Thank you for considering taking part in the project. Please keep a copy of this information sheet. You will also be given a copy of the consent form should you decide to sign it.

South London and Maudsley NHS
NHS Foundation Trust

Version 7

IRAS: 214063

02/03/2017

CONSENT FORM

Is there a Relationship between Memory for Past Events and Motivation for Future Activities?

Name of Researcher:

Please initial box

1. I confirm that I have read and understand the information sheet dated 02/03/2017 for the above project. I have had the opportunity to consider the information and ask questions. ☐

2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, without my medical care or legal rights being affected. ☐

3. If for any reason the project is terminated early I understand any data collected up to that point will be included in the project unless I request for it to be withdrawn in which case it will be destroyed. ☐

4. I give permission for the researcher to inform my care team that I am taking part in the project and provide information relevant to my care. I understand that my participation in the project will be recorded in my electronic notes. ☐

5. I understand that relevant sections of any of my electronic notes and data collected during the project may be looked at by the researcher on the project. I give permission for these individuals to have access to my records. ☐

6. I give permission for the research to audio record my memory narratives in order to fully capture the detail in the description of my memories.

7. I give permission for anonymized quotations from these audio recordings to be included in future publications (this is optional).

8. I agree to take part in the above project.

_____	_____	_____
Name of Participant	Date	Signature

I have explained the project to the participant and have answered their questions honestly and fully.

_____	_____	_____
Researcher	Date	Signature

Is there a Relationship between Memory for Past Events and Motivation for Future Activities?

Participant ID:
Date:

Baseline Data

Measure	**Completed**	**Initials**
Personal Details		
AMT		
Verbal Fluency Test		
Letter-Number Sequencing		
BDI		
DAS		
SAPS		
CAINS		
Time Use Survey		
Receipt		

Personal Details

1. Date of Birth

2. Age

3. Gender (M/F)

5. Marital Status

1. Single
2. Married
3. Divorced
4. Widowed

6. Country of origin

1. UK
2. West Indies
3. India and Asia
4. Africa
5. Other European
6. Other

7. Present Accommodation

1. Living with partner
2. Living with parent or relative
3. Living alone, or sharing house, flat
4. Living alone in lodgings (where some meals/laundry are provided)
5. Supervised hostel or reception centre
6. Hospital inpatient

8. Number of biological children

9. Current job status

1. None (includes housewife with no domestic responsibilities)
2. Unskilled
3. Semi-Skilled
4. Skilled
5. Housewife with domestic responsibility e.g. child, infirm, aged relative

12. Highest Education Level Achieved

1. Primary School
2. Secondary School
3. Further Education
4. Higher Education

13. Latest diagnosis

14. Number of hospital admissions in the past 2 years

15. Alcohol use

1. None
2. Once a month
3. Once a week
4. More than once a week

16. Drug use

1. None
2. Once a month
3. Once a week
4. More than once a week

17. State which drugs used

18. Psychological therapy partaken, when started and number of hours a week

19. Medication Currently Taken.

Name of Medication	Dose	Frequency	Depot Y/N

Autobiographical Memory Test

Instructions:

“Please think about a specific event in the past that occurred at a particular time and place and lasted no longer than 1 day.”

“As a practice please tell me about a specific time in the past when you listened to music or the radio.”

Feedback: Either “Exactly, now do the same for the rest of the narratives.” Or “Good, but for the rest of the task please tell me about an event that occurred at a specific time or place.”

[RECORD]

“Picture a specific time in the past when a negative event occurred. Tell me about it in as much detail as possible, as if you were telling a story.”

AMT- VAS

Please rate the memory you have just recalled by placing an 'X' on the following scales:

The number of visual details:

0 50 100

|_____|_____|_____|_____|

None *A lot*

The number of sounds:

0 50 100

|_____|_____|_____|_____|

None *A lot*

The number of smells and/or tastes:

0 50 100

|_____|_____|_____|_____|

None *A lot*

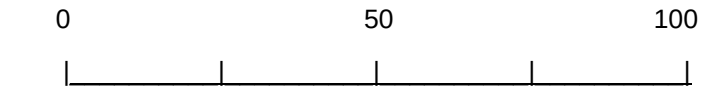
How clear was the location?

0 50 100

|_____|_____|_____|_____|

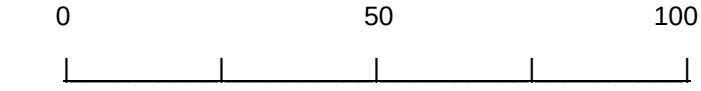
Not at all clear *Very Clear*

How clear was the arrangement of objects?



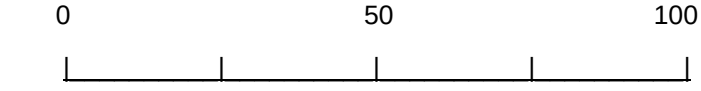
Not at all clear *Very Clear*

How clear was the arrangement of people?



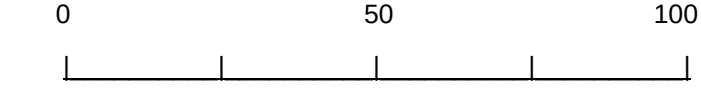
Not at all clear *Very Clear*

How clear was the time of day?

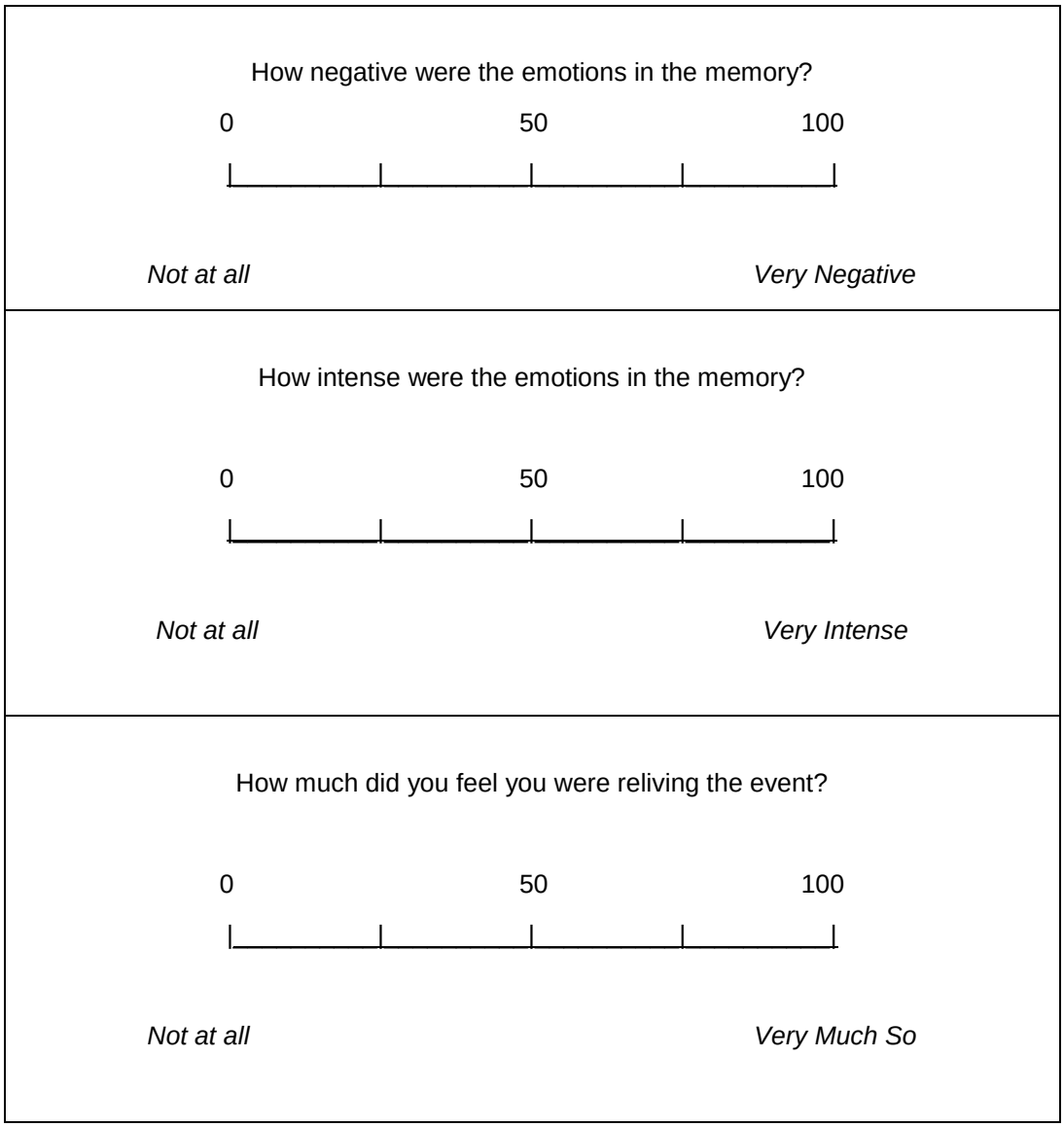


Not at all clear *Very Clear*

How positive were the emotions in the memory?



Not at all *Very Positive*



"Picture a specific time in the past when a positive event occurred. Tell me about it in as much detail as possible, as if you were telling a story."

AMT- VAS

Please rate the memory you have just recalled by placing an 'X' on the following scales:

The number of visual details:

0 50 100

|_____|_____|_____|_____|

None *A lot*

The number of sounds:

0 50 100

|_____|_____|_____|_____|

None *A lot*

The number of smells and/or tastes:

0 50 100

|_____|_____|_____|_____|

None *A lot*

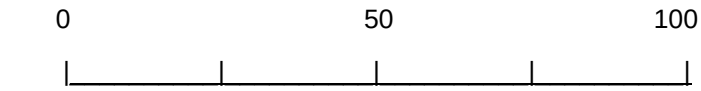
How clear was the location?

0 50 100

|_____|_____|_____|_____|

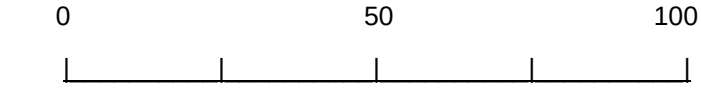
Not at all clear *Very Clear*

How clear was the arrangement of objects?



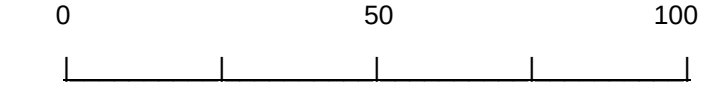
Not at all clear *Very Clear*

How clear was the arrangement of people?



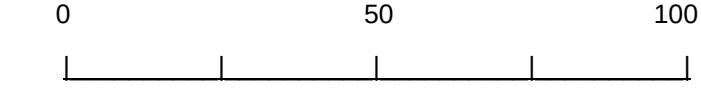
Not at all clear *Very Clear*

How clear was the time of day?



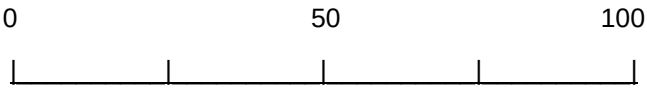
Not at all clear *Very Clear*

How positive were the emotions in the memory?



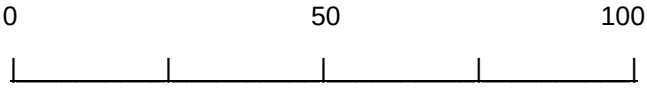
Not at all *Very Positive*

How negative were the emotions in the memory?



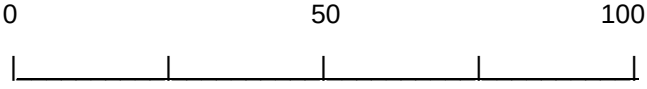
Not at all *Very Negative*

How intense were the emotions in the memory?



Not at all *Very Intense*

How much did you feel you were reliving the event?



Not at all *Very Much So*

Verbal Fluency Test

Say "I'm going to give you a letter of the alphabet and I'd like you to generate as many words as you can beginning with that letter, but not names of people or places. For example, if I give you the letter "J" you could give me words like "jump, jam" and so on. But, you can't give me words like Jack or Japan or use the same word and add to the end of it (e.g. Jump to jumping, jumped etc.) Do you understand? Are you ready? **You have one minute.** The letter I want you to use is the letter **"F".**

- Same again with the letter **"A".**
- Same again with the letter **"S".**

'F' Words

'A' Words

'S' Words

Say “We are now going to do exactly the same thing but this time with categories instead of letters. So, I am going to give you a category and I would like you to tell me as many words as you can that belong to that category, following the same rules as before. Do you understand? Are you ready? **You have one minute.** The first category is **“animals”.**

- Same again with **“vegetables”.**
- Same again with **“fruits”.**

'Animals'

'Vegetables'

'Fruits'

Letter Number Sequencing

I am going to say a group of numbers and letters. After I say them, I want you to tell me the numbers first, in numerical order, starting with the lowest number. Then tell me the letters in alphabetical order. For example, if I say B-7, your answer should be 7-B. The number goes first,

then the letter. If I say 9 – C – 3, then your answer should be 3-9-C, the numbers in order first, then the letters in alphabetical order.

Let's practice.	*F-6*	(6-F)
	G-4	(4-G)
	3-W-5	(3-5-W)
	T-7-L	(7-L-T)
	1-J-A	(1-A-J)

If the examinee makes an error on any Practice Item, correct her or him and repeat the instructions as necessary. Even if the examinee fails all Practice Items, continue with the subtest. Do not repeat items.

FAIL RULE: Test discontinued if all 3 trials of an item are missed.

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BDI

Instructions: This questionnaire consists of 21 groups of statements. Please read each group of statements carefully, and

then pick out the **one statement** in each group that best describes the way you have been feeling during the **past two weeks, including today.** Circle the number beside the statement you have picked. If several statements in the group seem to apply equally well, circle the highest number for that group. Be sure that you do not choose more than one statement for any group, including Item 16 (Changes in Sleeping Pattern) or Item 18 (Changes in Appetite).

1. Sadness

0 I do not feel sad.
1 I feel sad much of the time.
2 I am sad all the time.
3 I am so sad or unhappy that I can't stand it.

2. Pessimism

0 I am not discourage about my future.
1 I feel more discouraged about my future than I used to be.
2 I do not expect things to work out for me.
3 I feel my future is hopeless and will only get worse.

3. Past Failure

0 I do not feel like a failure.
1 I have failed more than I should have.
2 As I look back, I see a lot of failures.
3 I feel I am a total failure as a person.

4. Loss of Pleasure

0 I get as much pleasure as I ever did from the things I enjoy.
1 I don't enjoy things as much as I used to.
2 I get very little pleasure from the things I used to enjoy.
3 I can't get any pleasure from the things I used to enjoy.

5. Guilty Feelings

0 I don't feel particularly guilty.
1 I feel guilty over many things I have done or should have done.
2 I feel quite guilty most of the time.
3 I feel guilty all of the time.

6. Punishment Feelings

0 I don't feel I am being punished.
1 I feel I may be punished.
2 I expect to be punished.
3 I feel I am being punished.

7. Self-Dislike

0 I feel the same about myself as ever.
1 I have lost confidence in myself.
2 I am disappointed in myself.
3 I dislike myself.

8. Self-Criticalness

0 I don't criticize or blame myself more than usual.
1 I am more critical of myself than I used to be.
2 I criticize myself for all of my faults.
3 I blame myself for everything bad that happens.

9. Suicidal Thoughts or Wishes

0 I don't have any thoughts of killing myself.
1 I have thoughts of killing myself, but I would not carry them out.
2 I would like to kill myself.
3 I would kill myself if I had the chance.

10. Crying

0 I don't cry anymore than I used to.
1 I cry more than I used to.
2 I cry over every little thing.
3 I feel like crying, but I can't.

11. Agitation

0 I am no more restless or wound up than usual.
1 I feel more restless or wound up than usual.
2 I am so restless or agitated that it's hard to stay still.
3 I am so restless or agitated that I have to keep moving or doing something.

12. Loss of Interest

0 I have not lost interest in other people or Activities
1 I am less interested in other people or things

17. Irritability

0 I am no more irritable than usual.
1 I am more irritable than usual.
2 I am much more irritable than usual.
3 I am irritable all the time.

18. Changes in Appetite

0 I have not experienced any change in my appetite.
1a My appetite is somewhat less than usual.
1b My appetite is somewhat greater than usual.
2a My appetite is much less than before.

DAS-DPA

Instructions: This inventory lists different attitudes or beliefs which people sometimes hold. Read EACH statement carefully and decide how much you agree or disagree with the statement. For each of the attitudes, circle the number under the column that BEST DESCRIBES HOW YOU THINK. Be sure to choose only one answer for each attitude. Because people are different, there is no right answer or wrong answer to these statements. To decide whether a given attitude is typical of your way of looking at things, simply keep in mind what you are like MOST OF THE TIME.

……

1. It is difficult to be happy unless one is good-looking, intelligent, rich and creative.

1	2	3	4	5	6	7
agree totally	agree very much	agree slightly	Neutral	disagree slightly	disagree very much	disagree totally

2. People will probably think less of me if I make a mistake.

1	2	3	4	5	6	7
agree totally	agree very much	agree slightly	Neutral	disagree slightly	disagree very much	disagree totally

3. If I do not do well all the time, people will not respect me.

1	2	3	4	5	6	7
agree totally	agree very much	agree slightly	Neutral	disagree slightly	disagree very much	disagree totally

4. If a person asks for help, it is a sign of weakness.

1	2	3	4	5	6	7
agree totally	agree very much	agree slightly	Neutral	disagree slightly	disagree very much	disagree totally

5. If I do not do as well as other people, it means I am an inferior human being.

1	2	3	4	5	6	7
agree totally	agree very much	agree slightly	Neutral	disagree slightly	disagree very much	disagree totally

6. If I fail at my work, then I am a failure as a person.

1	2	3	4	5	6	7
agree totally	agree very much	agree slightly	Neutral	disagree slightly	disagree very much	disagree totally

7. If you cannot do something well, there is little point in doing it at all.

1	2	3	4	5	6	7
agree totally	agree very much	agree slightly	Neutral	disagree slightly	disagree very much	disagree totally

8. Making mistakes is fine because I can learn from them.

1	2	3	4	5	6	7
agree totally	agree very much	agree slightly	Neutral	disagree slightly	disagree very much	disagree totally

9. If someone disagrees with me, it probably indicates he/she does not like me.

1	2	3	4	5	6	7
agree totally	agree very much	agree slightly	Neutral	disagree slightly	disagree very much	disagree totally

10. If I fail partly, it is as bad as being a complete failure.

1	2	3	4	5	6	7
agree totally	agree very much	agree slightly	Neutral	Disagree slightly	disagree very much	disagree totally

11. If other people know what you are really like, they will think less of you.

1	2	3	4	5	6	7
agree totally	agree very much	agree slightly	Neutral	disagree slightly	disagree very much	disagree totally

12. If I am to be a worthwhile person, I must be truly outstanding in one major respect.

1	2	3	4	5	6	7
agree totally	agree very much	agree slightly	Neutral	disagree slightly	disagree very much	disagree totally

13. People who have good ideas are more worthy than those who do not.

1	2	3	4	5	6	7
agree totally	agree very much	agree slightly	Neutral	disagree slightly	disagree very much	disagree totally

14. If I ask a question, it makes me look inferior.

1	2	3	4	5	6	7
agree totally	agree very much	agree slightly	Neutral	disagree slightly	disagree very much	disagree totally

15. I cannot trust other people because they might be cruel to me.

1	2	3	4	5	6	7
agree totally	agree very much	agree slightly	Neutral	disagree slightly	disagree very much	disagree totally

CAINS

ID: _____ **DATE:** _____ **RATER:** _____

Overall Introduction: *In this interview, I'll be asking you some questions about things you have been doing over the past week. In the first section, I'm going to ask you some questions about your family, romantic partners, and friends, including how motivated you have been to spend time with them and how you felt when you were around them.*

I. SOCIAL (MOTIVATION & PLEASURE)

ITEM 1: MOTIVATION FOR CLOSE FAMILY/SPOUSE/PARTNER RELATIONSHIPS

[Note: Romantic relationships can be rated in either Item 1 or Item 2 but NOT both. A spouse/ partner relationship in which the couple is living together should be assessed in Item 1. A dating/romantic relationship in which the couple is not living together should be assessed in Item 2.]

The following questions are about your family. This can include relatives like parents, brothers or sisters and other relatives, as well as your spouse [if married] or live-in partner. Have you been in contact with or visited with any family members in the past week (in person, phone, email)? Any contact with a spouse or partner?

IF CONTACT:

- *Who have you been in contact with?*
- *What things have you done with your family?*
- *IF RELEVANT: What things have you done with your spouse/partner?*
- *How much time did you spend together?*

Behavior

- *What have you done to see or contact your [family/spouse/partner] in the past week?*
- *When you were with your [family/spouse/partner] who decided what you would do?*
- *Who started the conversation? Did you start it? Did your [family/spouse/partner]? Were you involved in the conversation?*
- *Did you ever find that you quickly wanted to end your interactions with your [family/spouse/partner]? Did you want them to last longer?*

Motivation & Interest in Closeness

- *Have you been motivated to be around or in touch with your [family/spouse/partner] in the past week? (Why is that?)*
- *What did you talk about? Can you talk about good and bad times with your [family/spouse/partner]?*
- *How close do you feel to your [family/spouse/partner]? What does being close mean for you?*
- *Were there times in the past week when you just didn't want to be around or in touch with your [family/spouse/partner]?*

- *How important is being part of a family to you?*
- *What about that is important to you? Have you felt this way throughout the past week?*

IF NO FAMILY CONTACT:

[NOTE: This section applies when not part of a close family or if available relatives could be contacted but person has chosen not to interact. If the person is not currently in a relationship with a live-in spouse/partner, interest in romantic relationships is assessed in Item 2.]

- *Has your family tried to contact you or visit you in the last week?*
- *Has anything kept you or held you back from being in contact with your family?*
- *Do you wish you were closer to your family? OR Do you wish you were part of a close family?*
- *Did you miss interacting with your family in the past week?*
- *Is having a relationship with your family important to you? What about having a relationship is important to you?*
- *Have you preferred to spend your time alone rather than with your family?*

Item 1 – Motivation for Close Family/Spouse/Partner Relationships

0 = No impairment: VERY INTERESTED in and highly values close family bonds as one of the most important parts of life. Strongly desires and is highly motivated to be in contact with family. Regularly initiates and persists in interactions with family and actively engages in these interactions; good and bad times are openly discussed. Well within normal limits.

1 = Mild deficit: GENERALLY INTERESTED in and values close family bonds though response suggests some minor or questionable reduction. Generally desires and is motivated to maintain contact with family. Has a close relationship with family member(s) in which good and bad times can be discussed. Mild deficit in initiating and persisting in regular interactions with family – generally actively engaged when interactions occur.

2 = Moderate deficit: SOMEWHAT INTERESTED in family relationships and considers them somewhat important. May occasionally miss close connections with family but is only somewhat motivated to seek out interaction with family. Notable deficit in initiating and persistently engaging in interactions; discussion of good and bad times is limited. Interactions with family members may occur but are largely superficial and participation is best characterized as "going through the motions"; interactions are more likely initiated by family with mostly passive involvement of the person.

3 = Moderately severe deficit: LITTLE INTEREST in family relationships (could "take it or leave it") and does not describe family bonds as important. Describes hardly any motivation and minimal effort to have close family relationships. Rarely has discussion of good and bad times with family members. Contact and engagement with family is superficial and passive with almost all initiation and efforts to engage coming from others.

4 = Severe deficit: NO INTEREST in family relationships and does not consider them at all important. Prefers to be alone and is not at all motivated to be with family. If person does see family, it is done so grudgingly, passively and with no interest.

ITEM 2: MOTIVATION FOR CLOSE FRIENDSHIPS & ROMANTIC RELATIONSHIPS

Let's talk about friends (IF RELEVANT: and dating or romantic relationships) now. By friends, I mean people who you know and spend time with, anyone you consider a friend, or people you can rely on and count on. Have you had any contact with friends in the last week (in person, phone, email)? IF RELEVANT: have you been in contact with a romantic partner or dating in the last week?

IF CONTACT:

- In the past week, what have you done with your [friends/partner/dates]?
- Tell me about what you did [or what you talked about] during that [visit, activity, conversation]?

Behavior

- What steps did you take to see or contact your [friends/partner/dates] in the past week?

- When you were with your [friends/partner/dates], who decided what you would do?
- When you spoke with your [friends/partner/dates], who started the conversation? Did you?
- Did you ever find that you quickly wanted to end your interaction with your [friends/partner/dates]? Did you want them to last longer?

Motivation & Interest in Closeness

- *Have you been motivated to be around your friends* (partner/dates) *in the past week? Why is that?*
- *Can you talk about both good times and bad times?*
- *Were there times in the past week when you just didn't feel like being around your friends* (partner/dates)*?*
- *How important is having friendships* (partner/dates) *to you? What about that is important to you?*
- *How close do you feel to your friends* (partner/dates)*? What does being close mean for you?*

IF NO FRIENDS/ROMANTIC CONTACT:

- *Are you interested in having friends or dating?*
- *Is having friendships [or being in a romantic relationship] important to you? If Yes, what about [specify friendships/romantic partner] is important?*
- *Did you miss these types of relationships in the past week?*
- *Would you like to have friends [or a romantic partner] with whom you could talk about good and bad times?*
- *(If any indication of interest) Have you taken any steps to meet someone who might be a friend (or romantic partner)?*
- *Has anything kept you or held you back from being in contact with your friends?*
- *Would you prefer to have friendships [or a romantic relationship] or would you prefer to be alone?*

Item 2 – Motivation for Close Friendships & Romantic Relationships

0 = No impairment: VERY INTERESTED in and highly values friend/romantic relationships as one of the most important parts of life. Strongly desires and is very motivated to engage in friendships. Regularly initiates and persists in interactions with friends/partner and actively engages in these interactions; good and bad times are openly discussed. Well within normal limits.

1 = Mild deficit: GENERALLY INTERESTED in and values friend/romantic relationships though response suggests some minor or questionable reduction. Generally desires and is motivated to engage in friendships. Has friendships/relationship in which good and bad times can be discussed though this may be less consistent. Mild deficit in initiating or persistently engaging during interactions with friends/partner. If no friends/relationship, misses friend/romantic relationships, is motivated to have friends/relationship, and makes efforts to seek out friends/relationship.

2 = Moderate deficit: SOMEWHAT INTERESTED in friend/romantic relationships and considers them somewhat important. May occasionally miss close connections with friends/partner and is somewhat motivated to have friends/partner. Notable deficit in initiating and persistently engaging in interactions; discussion of good and bad times is limited. Interactions with friends/romantic partner may occur but are largely superficial and participation is best characterized as "going through the motions"; interactions are initiated by others with mostly passive involvement of the person. If no friend/romantic relationships, is only somewhat motivated to have friends/partner and rarely if ever seeks out friends/partner.

3 = Moderately severe deficit: LITTLE INTEREST in friend/romantic relationships (could "take it or leave it") and does not describe friends/partner as important. Describes hardly any motivation to have friendships, and would just as soon be alone. Contact and engagement with others is superficial and passive with almost all initiation and efforts to engage coming from others.

4 = Severe deficit: NO INTEREST in friend/romantic relationships and does not consider them at all important. Prefers to be alone and is not at all motivated to have friends/partner.

ITEM 3: FREQUENCY OF PLEASURABLE SOCIAL ACTIVITIES – *PAST* WEEK

[NOTE: Ratings are based on **NUMBER OF DAYS IN THE WEEK** that pleasurable activity with other people is experienced. When there are reports of several different activities occurring, clarify if these happened on same or different days.]

Now, I want to talk to you about how you felt during the times you spent with or were in contact with others during the past week. You can include times with any of the people we have talked about so far or anyone else. Did you have any enjoyable interactions with other people, such as:

- *Family* (PAUSE)
- *Romantic or dating partners* (PAUSE)
- *Friends* (PAUSE)
- *Any other enjoyable social interactions or time spent with people*? (pause)

IF YES:

- *What about that was enjoyable?*

• *How many days did you enjoy/get pleasure from these interactions [time spent with xx person(s)] (for each)?*
• [If many (i.e., 5 or 6) days mentioned or if not clear which days of week interactions were enjoyed] *Were there any days that you did not have enjoyable interactions with other people?*

Item 3 – Frequency of Pleasurable Social Activities – Past Week

0 = No impairment: Pleasure experienced daily.
1 = Mild deficit: Pleasure experienced 5-6 days.
2 = Moderate deficit: Pleasure experienced 3-4 days.
3 = Moderately severe deficit: Pleasure experienced 1-2 days.
4 = Severe deficit: No pleasure reported

ITEM 4: FREQUENCY OF EXPECTED PLEASURE FROM SOCIAL ACTIVITIES – *NEXT* WEEK

[NOTE: Ratings are based on total **NUMBER OF EXPECTED PLEASURABLE ACTIVITIES,** regardless of days on which they are expected to occur].

Now I would like you to think ahead to NEXT week (next 7 days); thinking about whom you will spend time with. You can include people you have already talked about or anyone else. What do you think you will enjoy doing in the NEXT week with other people, such as your family (PAUSE), romantic partners (PAUSE), friends (*IF NEEDED: people brought up in other sections*)*?*

IF ANSWERS PROVIDED:

• *What about it do you expect to enjoy?*
• *How often do you think you will enjoy this in the next week?*

FOLLOW UP

• *Are there other experiences with people you think you will enjoy in the next week?*

ITEM 4 – Frequency of Expected Pleasure from Social Activities – Next week

0 = No impairment: Expecting MANY (7 or more) pleasurable experiences.
1 = Mild deficit: Expecting enjoyment from SEVERAL (5-6) pleasurable experiences.
2 = Moderate deficit: Expecting enjoyment from a FEW (3-4) pleasurable experiences.
3 = Moderately severe deficit: Expecting a COUPLE (1-2) pleasurable experiences.
4 = Severe deficit: Expecting NO pleasurable experiences.

II. WORK & SCHOOL (MOTIVATION & PLEASURE)

ITEM 5: MOTIVATION FOR WORK & SCHOOL ACTIVITIES

Now I am going to ask you some questions about work and school, including how motivated you have been for work or school activities and how you felt while doing these things over the past week. Have you been working or going to school over the past week? Any volunteer work? Are you in a work-related treatment program?

IF IN A RELEVANT ROLE:

- *Tell me about what you do in your [insert role here]*
- *How much time has this involved over the past week?*

Behavior

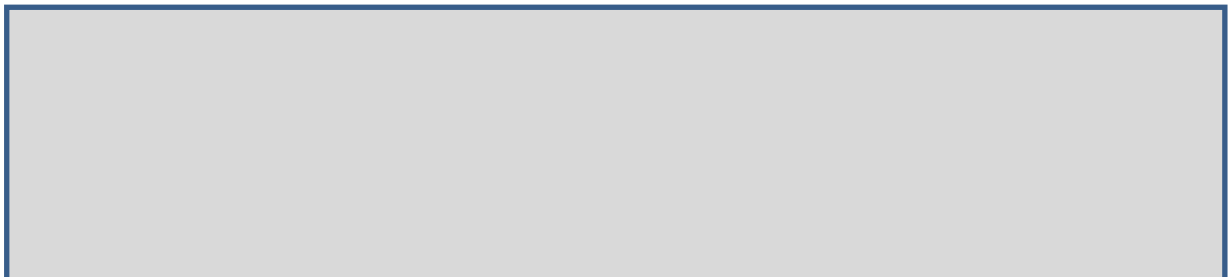
- *Have you been able to complete tasks at [insert role here]?*
- *In the past week has anyone raised any concerns with your [insert role here] performance?*
- *Have you missed any days in the past week? Why?*
- *Does someone need to remind you about [insert role here]? Why is that?*
- *Were there things you meant to do or were supposed to do but just never got around to doing them? Why?*

Motivation

- *How do you feel about [insert role here]?*
- *Have you been motivated to do your [insert role here]?*
- *What motivates you to do your [insert role here]?*
- *Were there times during the past week when you just didn't feel like [insert role here]?*
- *How important is your [insert role here] to you? What about it is important?*

IF NO CURRENT ROLE:

- *Is there a reason why you are not currently (work/school/volunteer)?*
- *Has anything held you back from looking for (work/school/volunteer)?*
- *How do you feel about working or going to school or volunteering?*
- *Have you felt much interest in work/school/volunteer? (Tell me more)*
- *Is working important to you? What about working/going to school/volunteering is important?*
- *Do you miss work/school/volunteer?*
- *Have you tried to take any steps to start working/going to school/volunteering? What steps have you taken? How often have you looked into work/school/volunteer?*



ITEM 5 – Motivation for Work & School Activities

0 = No impairment: Person is VERY MOTIVATED to seek out work or school, or new opportunities in work or school; initiates and persists in work, school, or job-seeking on a regular basis. Well within normal limits.
1 = Mild deficit: Person is GENERALLY MOTIVATED to seek out work or school or new opportunities in work or school; a mild deficit in initiating and persisting; may report instances of initiating, but with moderate persistence.
2= Moderate deficit: Person is SOMEWHAT MOTIVATED to seek out work or school or new opportunities in work or school; notable deficit in initiating; may have initiated activities, but needed reminders on multiple occasions, and/or not initiated any new activities, and/or not persisted for very long.
3 = Moderately severe deficit: Person is only SLIGHTLY MOTIVATED to seek out work or school or new opportunities in work or school; significant deficit in initiating; may have needed constant reminders, and/or initiated a few activities; did not persist for very long.
4 = Severe deficit: Person is NOT AT ALL MOTIVATED to seek out work / school; nearly total lack of initiation and persistence in work, school, or job seeking.

ITEM 6: FREQUENCY OF EXPECTED PLEASURE FROM WORK & SCHOOL ACTIVITIES - *NEXT* WEEK

[NOTE: Ratings are based on total **NUMBER OF EXPECTED PLEASURABLE ACTIVITIES,** regardless of days on which they are expected to occur].

Now I would like you to think ahead to NEXT week (next 7 days); thinking about work/volunteer/school.

IF HAS A RELEVANT ROLE:

• *What do you think you will enjoy doing in the NEXT week at work/volunteer/school, etc.*

IF NO RELEVANT ROLE:

• *Do you think you will enjoy anything related to seeking paid or volunteer work, or school?*

IF ANSWERS PROVIDED:

• *What about it do you expect to enjoy?*
• *How often do you think you will enjoy this in the next week?*

FOLLOW UP:

• *Are there other work/school experiences you think you will enjoy in the next week?*

ITEM 6 – Frequency of Expected Pleasure from Work & School Activities – *Next* Week

0 = No impairment: Expecting MANY (7 or more) pleasurable experiences.
1 = Mild deficit: Expecting enjoyment from SEVERAL (5-6) pleasurable experiences.
2 = Moderate deficit: Expecting enjoyment from a FEW (3-4) pleasurable experiences.
3 = Moderately severe deficit: Expecting a COUPLE (1-2) pleasurable experiences.
4 = Severe deficit: Expecting NO pleasurable experiences.

III. RECREATION (MOTIVATION & PLEASURE)

ITEM 7: MOTIVATION FOR RECREATIONAL ACTIVITIES

In the next section, I am going to ask you some questions about what you do in your free time – any hobbies or recreational activities. I will ask about your motivation and feelings about the things that you have done in your free time over the past week.

- *What have you done in your free time in the past week?*
- *Have you participated in any hobbies or leisure activities such as sports or games, going to church, TV, music, reading, internet, walking or other such activities during the past week?*

IF YES:

Behavior

- *Tell me about (activity). How much time has this involved over the past week? Did you want to do (activity) more than that? Did it last longer than you had hoped? Why did it only last for (xx)?*
- *Did anything get in the way of doing these activities over the past week? What was that?*

Motivation

- *How has your motivation or drive to get involved in these activities been over the past week?*
- *Did you ever feel like you just weren't very interested in these activities?*
- *Are these types of activities important to you? Why? Have you been interested in these activities?*
- *Did you ever feel that you would just as soon do nothing instead of getting involved in these types of activities?*

IF NO:

- *Is there a reason why you haven't gotten involved in any hobbies or recreational activities in the past week?*
- *Have you wanted to or were you motivated to do something with your free time in the past?*
- *Did anything ever get in the way of doing these types of activities over the past week? What was that?*

ITEM 7 – Motivation for Recreational Activities

0 = No impairment: Person is VERY MOTIVATED to seek out hobbies and recreational activities; initiates and persists in hobbies and recreational activities on a regular basis, well within normal limits.

1 = Mild deficit: Person is GENERALLY MOTIVATED to seek out hobbies and recreational activities; a mild deficit in initiating and persisting; may report initiating hobbies, but with moderate persistence.

2 = Moderate deficit: Person is SOMEWHAT MOTIVATED to seek out hobbies and recreational activities; notable deficit in initiating; may have initiated some activities and/or not persisted for very long. Others were somewhat more likely to initiate hobbies or activities.

3 = Moderately severe deficit: Person is only SLIGHTLY MOTIVATED to seek out hobbies and recreational activities; significant deficit in initiating and persisting; may have initiated a few activities and not persisted for very long. Others were much more likely to initiate hobbies or prompt initiation.

4 = Severe deficit: Person is NOT AT ALL MOTIVATED to seek out hobbies and recreational activities; nearly total lack of initiation and persistence in hobbies or recreational activities.

ITEM 8: FREQUENCY OF PLEASURABLE RECREATIONAL ACTIVITIES – *PAST* WEEK

[NOTE: Rating is based on both **VARIETY** of pleasurable activities and **DAILY FREQUENCY** that these are experienced. When there are reports of several different activities occurring, need to clarify if these happened on same or different days.]

Did you have any enjoyable (pleasurable) experience from things you did in your free time last week? You can include any of the activities we've talked about so far or any other leisure activities in the past week, including [use as needed] TV, sports or games, going to church, music, reading, internet, walking or other such activities?
- *What about [insert activity here] was enjoyable?*
- *How many days did you enjoy/get pleasure from these experiences?*

FOLLOW UP:

Any other enjoyable experiences from things you do in your free time or your hobbies?

ITEM 8 – Frequency of Pleasurable Recreational Activities - Past Week

0 = No impairment: At least A FEW (3) different types of pleasurable experiences, experienced daily.
1 = Mild deficit: At least A FEW (3) different types of pleasurable experiences, experienced more days than not.
2 = Moderate deficit: 1 or 2 different types of pleasurable experiences, experienced more days than not.
3 = Moderately severe deficit: 1 type of pleasurable experience, experienced on just a few days.
4 = Severe deficit: No pleasurable experience

ITEM 9: FREQUENCY OF EXPECTED PLEASURABLE RECREATIONAL ACTIVITIES – *NEXT* WEEK

[NOTE: Ratings are based on total **NUMBER OF EXPECTED PLEASURABLE ACTIVITIES,** regardless of days on which they are expected to occur]

Now I would like you to think ahead to NEXT week (next 7 days); thinking about free time/hobbies/ recreation. What do you think you will enjoy doing in the NEXT WEEK in your recreational time [use as needed] such as sports or games, going to church, TV, music, reading, internet, walking or other such activities?
• *What about it do you expect to enjoy?*
• *How often do you think you will enjoy [activity] in the next week?*

FOLLOW UP:

• *Are there other things you do in your free time like hobbies or recreational activities that you think you will enjoy in the next week?*

ITEM 9 – Frequency of Expected Pleasure From Recreational Activities – Next Week

0 = No impairment: Expecting MANY (7 or more) pleasurable experiences.
1 = Mild deficit: Expecting enjoyment from SEVERAL (5-6) pleasurable experiences.
2 = Moderate deficit: Expecting enjoyment from a FEW (3-4) pleasurable experiences.
3 = Moderately severe deficit: Expecting a COUPLE (1-2) pleasurable experiences.
4 = Severe deficit: Expecting NO pleasurable experiences.

IV. EXPRESSION

ITEM 10: FACIAL EXPRESSION

When making the facial expression rating, consider facial movements across all parts of the face, including in the eyes (e.g., raised brows), mouth (smiling or grimacing), and mid-face (e.g., wrinkled nose when disgusted).

ITEM 10 - Facial Expression

- **0 = No impairment:** WITHIN NORMAL LIMITS; frequent expressions throughout the interview.
- **1 = Mild deficit:** MILD DECREASE in the frequency of facial expressions, with limited facial expressions during a few parts of the interview.
- **2 = Moderate deficit:** NOTABLE DECREASE in the frequency of facial expressions, with diminished facial expressions during several parts of the interview.
- **3 = Moderately severe deficit:** SIGNIFICANT LACK of facial expressions, with only a few changes in facial expression throughout most of the interview.
- **4 = Severe deficit:** NEARLY TOTAL LACK of facial expressions throughout the interview.

ITEM 11: VOCAL EXPRESSION

This item refers to prosodic features of the voice. This item reflects changes in tone during the course of speech. Speech rate, amount, or content of speech is not assessed.

Item 11 - Vocal Expression

- **0 = No impairment:** WITHIN NORMAL LIMITS. Normal variation in vocal intonation across interview. Speech is expressive and animated.
- **1 = Mild deficit:** MILD DECREASE in vocal intonation. Variation in intonation occurs with a limited intonation during a few parts of the interview.
- **2 = Moderate deficit:** NOTABLE DECREASE in vocal intonation. Diminished intonation during several parts of the interview. Much of speech is lacking variability in intonation but prosodic changes occur in several parts of the interview.
- **3 = Moderately severe deficit:** SIGNIFICANT LACK of vocal intonation with only a few changes in intonation throughout most of the interview. Most of speech is flat and lacking variability, only isolated instance of prosodic change.
- **4 = Severe deficit:** NEARLY TOTAL LACK OF change in vocal intonation with characteristic flat or monotone speech throughout the interview.

ITEM 12: EXPRESSIVE GESTURES

Expressive gestures are used to emphasize what is communicated verbally through gestures made with the hands, head (nodding), shoulders (shrugging), and trunk (leaning forward, leaning back).

ITEM - 12 Expressive Gestures

0 = No impairment: WITHIN NORMAL LIMITS; uses frequent gestures throughout the interview.
1 = Mild deficit: MILD DECREASE in the frequency of expressive gestures, with limited gestures in a few parts of the interview.
2= Moderate deficit: NOTABLE DECREASE in the frequency of expressive gestures, with lack of gestures during several parts of the interview.
3 = Moderately severe deficit: SIGNIFICANT LACK of expressive gestures, with only a few gestures throughout most of the interview.
4 = Severe deficit: NEARLY TOTAL LACK of expressive gestures.

ITEM 13: QUANTITY OF SPEECH

This item refers to the quantity of words spoken. Other speech abnormalities, such as disorganization, neologisms, or psychotic content are not rated here. For instance, a disorganized person may produce a large quantity of speech and have a low (normal) score on this item.

ITEM - 13 Quantity of speech

0 = No impairment: NORMAL AMOUNT of speech throughout the interview. Replies provide sufficient information with frequent spontaneous elaboration.
1 = Mild deficit: MILD DECREASE in the quantity of speech, with brief responses during a few parts of the interview.
2= Moderate deficit: NOTABLE DECREASE in speech output, with brief responses during several parts of the interview.
3 = Moderately severe deficit: SIGNIFICANT LACK of speech, with very brief answers (only several words) in responses throughout most of the interview.
4 = Severe deficit: All or nearly all replies are one or two words throughout the entire interview.

TIME USE INTERVIEW

EMPLOYMENT

(a) Did you do any paid work in the last month, either as an employee or self-employed?

YES GO TO QU 4

NO ASK b

Have you been on a government scheme for employment training?

YES DETAILS

NO GO TO QU 2

(a) Did you have a job or business you were away from?

YES ASK b

NO GO TO QU 3

Why were you away? (Then ask QU 4 for typical work pattern when not away)

Holiday	
Sickness	
Studying	
Maternity/paternity leave	
Other reason (please state)	

(a) Did you do any unpaid work for any business that you or a relative own?

YES GO TO QU 4

NO ASK b

Have you ever had a paid job?

YES	ASK c & questions 4-7 for **most recent** paid job
NO	GO TO QU 8

When did you leave your last paid job?

What was your main job in the last month/most recent period of paid work?

What do/did you mainly do in your job? (check special qualifications, managerial duties, etc)

How many hours a week do you usually work in your main job or business? Include any overtime. How many hours have you worked in the last month?

What was your take-home monthly pay after all deductions the last time you were paid?

1	Less than £215	
2	£215 to less than £435	
3	£435 to less than £870	
4	£870 to less than £1305	
5	£1305 to less than £174	
6	£1740 to less than £2820	

7	£2820 to less than £3420	
8	£3420 to less than £3830	
9	£3830 to less than £4580	
10	£4580 to less than £6670	
11	£6670 or more	

In the last month, did you do any other paid work or have any other paid job or business, in addition to the one you have just told me about?

YES DETAILS (e.g. how many, number of hours, type of job, wages)

NO IF NO PAID WORK AT ALL IN LAST MONTH, GO TO QU 8
IF CURRENTLY WORKING, GO TO QU 11

Thinking of the last month, have you been looking for any kind of paid work government training schemes?

YES ASK QU 9

NO GO TO QU 10

In the last month, did you do any of these things?

Visited a Jobcentre/Jobmarket or Training and Employment Agency Office?	
Visited a Jobclub?	
Had your name on the books of an employment agency?	
Advertised for jobs in newspapers, etc?	
Looked for advertisements in newspapers, etc?	
Answered advertisements in newspapers, etc?	
Applied directly to employers?	

Asked friends, relatives, colleagues or trade unions about jobs?	
Waited for the results of a job application?	
Been to an interview?	
Done anything else to find work? Please state.	

How much time did you spend doing this?

May I just check, what was the main reason you did not look for work in the last month?

Waiting for the results of a job application/being assessed by training agent?	
Student?	
Looking after the family home?	
Temporarily sick or injured?	
Long-term sick or disabled?	
Believe no jobs available?	
Not yet started looking?	
Any other reason? Please state.	

Are you at present receiving any state benefits in your own right or on behalf of anyone in your household? If so, which ones? (show list)

EDUCATION AND TRAINING

(a) Do you have any qualifications from school, college or university, connected with work or from government schemes?

YES	ASK b onwards
NO	GO TO QU 2
Don't know	GO TO QU 2

Which qualification do you have, starting with the highest qualification (show list)?

Which qualification do you have, starting with the highest qualification (show list)?

When did you last study for any qualifications?

When did you last study for any qualifications?

Are you studying for any qualifications at the moment (show list)?

YES DETAILS (e.g. what, where, full/part time, hours, etc)

1	Degree level qualification including graduate membership of a professional institute or PGCE or higher (include undergraduate and postgraduate degrees)	
2	Diploma in higher education	
3	HNC/HND	
4	ONC/OND	
5	BTEC, BEC or TEC	
6	SCOTVEC, SCOTEC or SCOTBEC	
7	Teaching qualification excluding PGCE	
8	Nursing or other medical qualification not yet mentioned?	
9	Other higher education qualification below degree level	
10	A-level or equivalent	
11	SCE highers	
12	NVQ/SVQ	
13	GNVQ/GSVQ	

14	AS-level	
15	Certificate of sixth year studies (CSYS) or equivalent	
16	O-Level or equivalent	
17	SCE Standard or Ordinary (O) grade	
18	GCSE	
19	CSE	
20	RSA	
21	City and Guilds	
22	YT certificate/YTP	
23	Any other professional or vocational qualification or foreign qualifications (e.g. apprenticeship)	
666	Don't know	

NO GO TO QU 3

(a) In the last month, have you been on any taught courses or undertaken learning of any of the following sorts:

Taught courses meant to lead to qualifications (even if you did not obtain them)	
Taught courses designed to help you develop skills that you might use in a job	
Courses or instruction or tuition in driving, in playing a musical instrument, in an art or craft, in a sport or in any practical skill	
Evening classes	
Learning which involved working on your own from a package of materials provided	

IF YES TO ANY OF THE ABOVE **ASK b**

IF NONE OF THE ABOVE **GO TO QU 4**

(b) How many taught courses have you been involved in in the last month?

4. In the last month, have you studied or received training in any of these ways:

Studied for a qualification without taking part in a taught course	
Received supervised training while you were actually doing a job	
Spent time keeping up-to-date with developments in the type of work you do without taking part in a taught course (e.g. by reading books, manuals journals, or attending seminars)	
Spent time deliberately trying to improve your knowledge about anything or teach yourself a new skill without taking part in a taught course	

IF YES TO ANY OF THE ABOVE DETAILS (e.g. what, number of occasions in last month, length of time, etc)

IF NONE OF THE ABOVE GO TO QU 6

On how many occasions in the last month did you spend time studying at home outside of teaching sessions?

How long did you study for the last time you did any? How long on average do you normally study for?

Thinking of the last month, have you been looking for any kind of education/course?

YES DETAILS (what, how much time, etc)

NO GO TO VOLUNTARY WORK

VOLUNTARY WORK

Voluntary work is work that people may do for which they are not paid, except perhaps for expenses.

Have you done any voluntary work through a group or on behalf of an organisation at any time during the last month?

YES DETAILS AND ASK 2 ONWARDS

NO GO TO 'LEISURE ACTIVITIES'

How many different times did you do this work during the last month?

How long did you work for, the last time you did this? How long do you normally spend doing this?

LEISURE ACTIVITIES

I am now going to ask some questions about things that some people do in their spare time. For each activity that I mention could you please tell me whether of not you have done this in the last month, AND how often?

ACTIVITY	NUMBER OF TIMES	AMOUNT OF TIME
Been to cinema, film society or club		
Been to a sports event as a spectator		
Been to a play, musical or pantomime		
Been to the opera		
Been to a concert or performance of classical music of any kind		
Been to any other gig or live music performance (e.g. pop, rock or jazz concert, blues or folk club)		
Been to the ballet or to a modern/contemporary dance performance		
Been to a museum or art gallery		
Been to an historic house, castle or other heritage site or building		
Been to a library		
Been out to eat or drink at a café, restaurant, pub or wine bar		
Been to a shopping centre, or mall, apart from regular shopping for food and household items		
Been to a car boot sale, antiques fair or craft market or similar apart from regular shopping for food and household items		
Been to a theme park, fairground, fair or carnival		
Been to a zoo, wildlife reserve, aquarium or farm park		
Been to some other place of entertainment (e.g. dance, club, bingo, casino)		
Been on any other outdoor trips (including going to places of natural beauty, picnics, going for a drive or going to the beach)		
Other (please state)		

On these cards is a list of sports and physical activities. Could you please tell me whether or not you took part in any of them in the last month AND how often?

ACTIVITY	NUMBER OF TIMES	AMOUNT OF TIME
Swimming or diving		
Cycling		
Indoor or outdoor bowls		
Tenpin bowling		
Keep fit, aerobics, yoga, dance exercise		
Martial arts		
Weight training or weight lifting		
Gymnastics		
Snooker, pool or billiards		
Darts		
Rugby		
Football		
Gaelic sports		
Cricket		
Hockey		
Netball		
Tennis		
Badminton		
Squash		
Basketball		
Table tennis		
Track and field athletics		
Jogging, cross country, road running		
Angling/fishing		
Yachting or dinghy sailing		
Canoeing		
Windsurfing/board sailing		
Ice-skating		
Curling		
Golf		
Skiing		
Horse riding		
Climbing/mountaineering		
Motor sports		
Shooting		

Walking or hiking for 2 miles or more (recreationally)		
Volleyball		
Other (please state)		

How much time do you spend socialising? How many occasions in the last month have you seen friends, either visiting them or receiving visitors? How much time did you tend to spend socialising on each occasion on average?

How much time do you spend resting, i.e. taking time out and doing nothing (but not sleeping)? How much time do you spend watching television or listening to the radio? Average for last month.

HOBBIES

Do you have any hobbies? Show list of examples.

How much time do you spend on hobbies each week (on average)?

CHILD CARE

Are you responsible for the care of any children?

YES	ASK 2
NO	GO TO 'HOUSEWORK AND CHORES'

How many? How old are they?

How much time do you spend doing things with your children? Ask individual to include checklist in their estimate (show card).

HOUSEWORK AND CHORES

How much time do you spend doing housework and chores per week? Ask individual to include checklist in their estimate.

Food management and preparation	
Cleaning, dusting, vacuuming, washing dishes	
Food shopping	
Washing	
Gardening	
DIY and repairs	
Other (please state)	

OTHER ACTIVITIES

How much time do you spend sleeping per day (on average)? This includes sleep at night time and naps during the day. Ask about good and bad days.

Do you spend time doing any activities not already asked about? Get weekly average.

TIME USE INTERVIEW SCORE SHEET

General Codings:

0 = NO **1 = YES**

666 = NO ANSWER/MISSING **999 = NOT APPLICABLE**

EMPLOYMENT

- Is paid work in the last month present or absent?

☐ Present = 'YES' response to Question 1 (a), 1 (b), or Question 2

Absent = 'NO' response to Question 1 or 2

NB. 'YES' response to Question 3 (a) should be coded as voluntary work

- Type of work/job title (Question 4)

☐

- Salary band (Question 6)

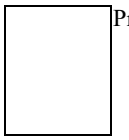
☐ Code 1-11 or 666/999 (see interview)

- Hours per week in paid employment over the last month

☐ NB. This should be calculated by adding all hours paid employment (from Questions 5 and 7) and dividing by 4 to get a weekly average. This includes time spent on government training schemes.

e.g. if someone generally gets one paid day of work per month, this is taken as 2 hours per week

- Active searching for work?

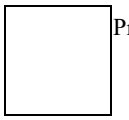


Present = 'YES' response to Question 8

Absent = 'NO' response to Question 8

Number of different work searching activities (taken from Question 9)

- Has paid work ever been present? (NB: Only code these items if no current paid work)



Present = 'YES' response to Question 3 (b)

Absent = 'NO' response to Question 3 (b)

If yes:

Number of hours per week worked in last (Response to Question 3c)

Number of weeks since last worked. (Response to Question 5)

What was the last paid job? (Question 4)

Salary band of your last job? (Question 6)

Code 1-11 or 666/999 (see interview)

EDUCATION

Highest level of educational qualification already achieved (Question 1b):

☐ Code 1-23 or 666/999 (see interview)

Other educational or vocational qualifications already achieved (Question 1b):

Enter codes:

☐

- Is current education present or absent?

☐ Present = any 'YES' response to Questions 2, 3 or 4

Absent = 'NO' responses to Questions 2, 3 and 4

Hours per week in education over the last month

☐ NB. This should be calculated by adding all hours spent in education (from Questions 2, 3 4 and 5) and dividing by 4 to get a weekly average.

- Number of different courses taken part in over last month

☐ NB. Taken from Questions 2, 3, 4, 5

- Active searching for education?

☐ Present = 'YES' response to Question 6

Absent = 'NO' response to Question 6

VOLUNTARY WORK

- Is voluntary work present or absent?

☐ Present = 'YES' response to Question 1 or Question 3 (a) from Employment section

Absent = 'NO' response to Question 1

- Hours per week spent in voluntary work over the last month

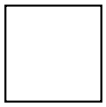
☐ NB. This should be calculated by multiplying number of times (Question 2) by average length of time (Question 3) and dividing the result by 4 to get a weekly average.

LEISURE ACTIVITIES

- Are leisure activities present or absent (taken from Question 1)

☐

- Hours per week spent in leisure activities over the last month

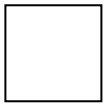
 NB. This should be calculated by multiplying number of times by average length of time for each activity. Then sum all of these and divide the result by 4 to get a weekly average.

- Number of leisure activities taken part in over last month

 NB. Taken from Question 1

- Are sport/physical activities present or absent (taken from Question 2)

- Hours per week spent in sport/physical activities over the last month

 NB. This should be calculated by multiplying number of times by average length of time for each activity. Then sum all of these and divide the result by 4 to get a weekly average.

- Number of sport/physical activities taken part in over last month

 NB. Taken from Question 2

- Hours per week over last month spent:

Socialising

Resting

HOBBIES

- Are hobbies present or absent?

- Hours per week spent on hobbies over the last month

NB. This should be calculated by multiplying number of times by average length of time for each activity. Then sum all of these and divide the result by 4 to get a weekly average.

- Number of hobbies taken part in over last month

CHILDCARE

- Childcare

Applicable = 1 Non-applicable = 0

- Hours per week spent on childcare

NB. Taken from Question 3

HOUSEWORK AND CHORES

- Hours per week spent on housework and chores

NB. Taken from estimate of average time including items from checklist in estimate

OTHER ACTIVITIES

- Hours spent per day sleeping (Question 1)

- Hours per week spent on other activities over the last month (Question 2)

NB. This should be calculated by multiplying number of times by average length of time for each activity. Then sum all of these and divide the result by 4 to get a weekly average.

- Number of other activities taken part in over last month (Question 2)

Interviewer Autobiographical Memory Rating Scale

1. **Time/Place**

2 = inclusion of a time and place indicator	1 = inclusion of a time or place indicator	0 = omission of a specific time and place indicator

2. **Sociality**

2 = active engagement with others	1 = passive (others present but no engagement)	0 = alone

3. **Elaborative Detail**

2 = elaborated	1 = moderately elaborated	0 = general

2 – elaborated – the narrative contained thorough and detailed descriptive information throughout.

1 – moderately elaborated – the memory included somewhat expanded and detailed descriptive information in some but not all of the narrative.

0 – general – the narrative was overly general and not very descriptive with respect to the essentials of the story.

4. **Clarity**

2 = clear	1 = moderately clear	0 = unclear

2 – clear – organised and easy to understand

1 – moderately clear – relatively understandable but at times the content was difficult to understand or follow.

0 – unclear - difficult to follow, disorganised or unintelligible.

5. Emotional Content

2 = a lot of emotional quality	1 = some emotional quality	0 = no emotional quality

Study 2 Intervention Protocol

Intervention Protocol

Introduction

Similarly to the previous time we met you will be asked to recall two things which you've done, in today's session we will only think about good or helpful things you've done.

We'll start off by selecting two things which you have done and I'll ask you some questions about them. Then we'll watch a video to find out about why our memories for things we've done are important. This will also talk about the most helpful ways of remembering things that have happened to us.

We will then go through a memory you have of something that you've done together and I will ask you some questions to help you think about it in detail.

After each thing you've done that you tell me about you will then be asked to complete a slightly longer questionnaire.

Memory 1

Instructions for Choosing a Positive Memory

1) Something you remember quite clearly, maybe from the last year or so.
2) The memory is of an event that did not last for more than one day.
3) Something you think you might like, and be able, to do again.

➔ Discuss memory choice with the person.

Questionnaire 1- Pre

1) Right now I feel [enthusiastic, satisfied, relaxed, cheerful] 0-10

2) Right now I feel [down, guilty, anxious, annoyed] 0-10

3) How likely is (specify behaviour or activity) to happen again? -10 (very unlikely)- 0 (neither likely nor unlikely) – 10 (very likely).

4) How able would you feel to do (specify behaviour or activity) in the future? 0 (not able at all) – 10 (very able)

5) How enjoyable would (specify behaviour or activity) be if it were to happen again? (-10 unpleasant -0 neutral -10 pleasant)

Intervention

Psychoeducation

Video with pauses for discussion (see psychoeducation plan with script and prompts).

Guided Memory Recall

Instructions

- Hold your memory of the good or helpful thing you did in mind
- Tell me about it as if you were telling a story
- Try to include specific details: where, when, who was there.
- Try to cover all 5 senses: sight, sounds, smells, touch, taste.
- Remember ABC: Activity, Be Specific, Consider.

Possible Additional Prompts

- Elaboration
    - How did you feel? What emotions were you experiencing? [have emotion prompt sheet visible]
    - How did you feel in your body?

- Generalisability
    - What is good or helpful about this thing that happened for you?
    - What does the fact that this happened say about you as a person?
    - What does this thing you've done tell you about what you like?
    - What does this thing you've done tell you about your strengths?
    - Does this thing that happened link to other things you've experienced?
    - What is similar about these experiences and this thing that happened?
    - What do these similarities tell us about you as a person?

- Links to the future
    - Would you like to repeat this (specify behaviour or activity)?
    - Why? What about it do you like? What about it matters to you? What did you enjoy about it at the time?
    - What would make it more likely that (specify behaviour or activity) will happen again in the future? What could you do to help make it more likely?

Questionnaire 2- Post

1) Right now I feel [enthusiastic, satisfied, relaxed, cheerful] 0-10

2) Right now I feel [down, guilty, anxious, annoyed] 0-10

3) How likely is (specific behaviour or activity) to happen again? -10 (very unlikely)- 0 (neither likely nor unlikely) – 10 (very likely).

4) How able would you feel to do (specific behaviour or activity) in the future? 0 (not able at all) – 10 (very able)

5) How enjoyable would (specific behaviour or activity) be if it were to happen again? (-10 unpleasant -0 neutral -10 pleasant)

6) How pleasant was the memory of (specific behaviour or activity)? (-10 unpleasant -0 neutral -10 pleasant)

7) The memory of (specific behaviour or activity) felt real to me (0 not at all – 10 very much so).

---------- Break Opportunity----------

Memory 2

Instructions for Choosing a Positive Memory

1) Something you remember quite clearly, maybe from the last year or so.
2) The memory is of an event that did not last for more than one day.
3) Something you think you might like and be able to do again.

➔ Discuss memory choice with the person.

Questionnaire 3- Pre

1) Right now I feel [enthusiastic, satisfied, relaxed, cheerful] 0-10

2) Right now I feel [down, guilty, anxious, annoyed] 0-10

3) How likely is (specify behaviour or activity) to happen again? -10 (very unlikely)- 0 (neither likely nor unlikely) – 10 (very likely).

4) How able would you feel to do (specify behaviour or activity) in the future? 0 (not able at all) – 10 (very able)

5) How enjoyable would (specify behaviour or activity) be if it were to happen again? (-10 unpleasant -0 neutral -10 pleasant)

Intervention

Guided Memory Recall

Instructions

- Hold your memory of the good or helpful thing you did in mind
- Tell me about it as if you were telling a story
- Try to include specific details: where, when, who was there.
- Try to cover all 5 senses: sight, sounds, smells, touch, taste.
- Remember ABC: Activity, Be Specific, Consider.

Possible Additional Prompts

- Elaboration
    - How did you feel? What emotions were you experiencing? [have emotion prompt sheet visible]
    - How did you feel in your body?

- Generalisability
    - What is good or helpful about this thing that happened for you?
    - What does the fact that this happened say about you as a person?
    - What does this thing you've done tell you about what you like?
    - What does this thing you've done tell you about your strengths?
    - Does this thing that happened link to other things you've experienced?
    - What is similar about these experiences and this thing that happened?
    - What do these similarities tell us about you as a person?

- Links to the future
    - Would you like to repeat this (specify behaviour or activity)?
    - Why? What about it do you like? What about it matters to you? What did you enjoy about it at the time?
    - What would make it more likely that (specify behaviour or activity) will happen again in the future? What could you do to help make it more likely?

Questionnaire 4- Post

1) Right now I feel [enthusiastic, satisfied, relaxed, cheerful] 0-10

2) Right now I feel [down, guilty, anxious, annoyed] 0-10

3) How likely is (specific behaviour or activity) to happen again? -10 (very unlikely)- 0 (neither likely nor unlikely) – 10 (very likely).

4) How able would you feel to do (specific behaviour or activity) in the future? 0 (not able at all) – 10 (very able)

5) How enjoyable would (specific behaviour or activity) be if it were to happen again? (-10 unpleasant -0 neutral -10 pleasant)

6) How pleasant was the memory of (specific behaviour or activity)? (-10 unpleasant -0 neutral -10 pleasant)

7) The memory of (specific behaviour or activity) felt real to me (0 not at all – 10 very much so).

➔ **Complete Feedback Questionnaire**

Study 2 Intervention Test Battery

Is there a Relationship between Memory for Past Events and Motivation for Future Activities?

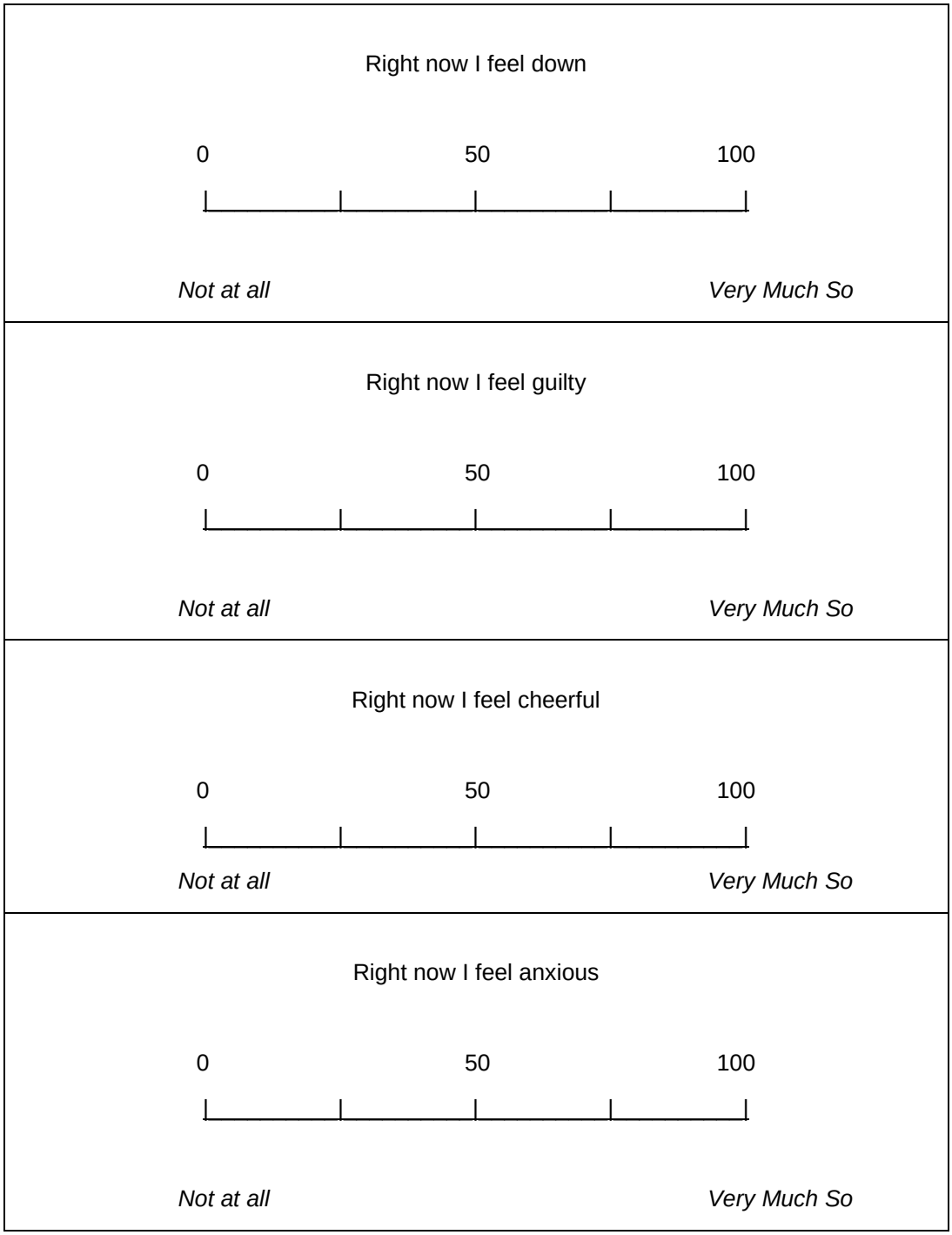
Participant ID:
Date:

Intervention Data

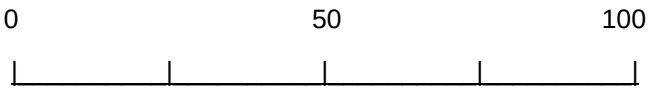
Measure	**Completed**	**Initials**
Memory 1 Pre-		
Memory 1 Post-		
Memory 2 Pre-		
Memory 2 Post-		
Feedback Questionnaire		

Memory 1 Pre-

Memory Keyword:

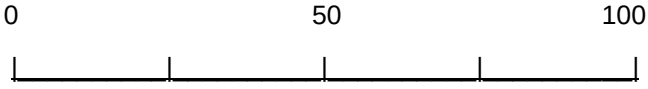


Right now I feel satisfied



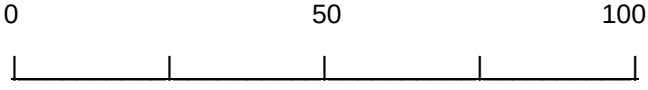
Not at all *Very Much So*

Right now I feel relaxed



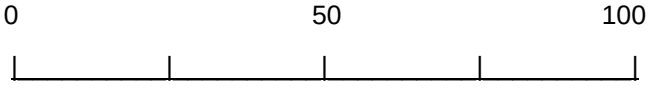
Not at all *Very Much So*

Right now I feel annoyed



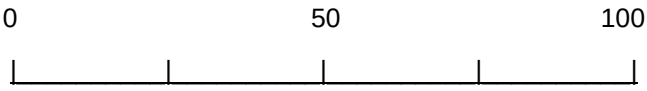
Not at all *Very Much So*

How likely do you think it is that _____ will happen again?



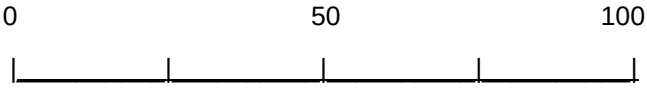
Not at all *Totally*

How able do you feel to do _____ again in the future?



Not at all *Totally*

How enjoyable would _____ be if you were to do it again?

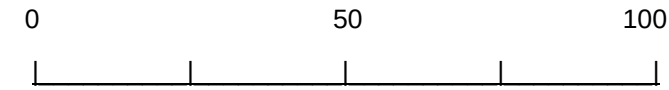


Not at all *Totally*

Memory 1 Post-

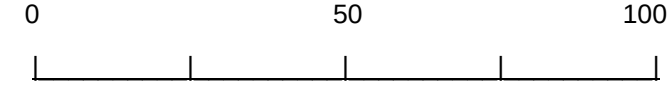
Memory Keyword:

Right now I feel down



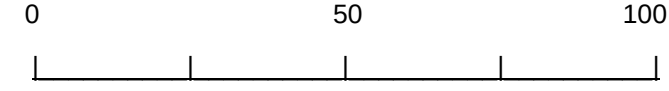
Not at all *Very Much So*

Right now I feel guilty



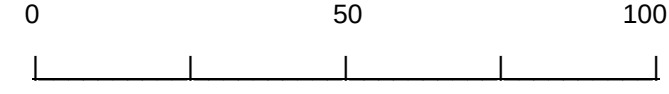
Not at all *Very Much So*

Right now I feel cheerful



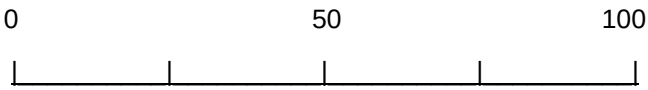
Not at all *Very Much So*

Right now I feel anxious



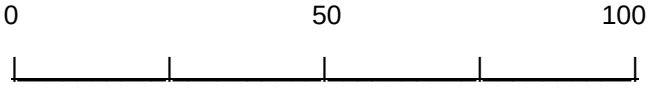
Not at all *Very Much So*

Right now I feel satisfied



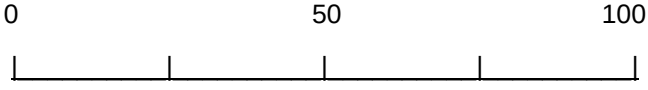
Not at all *Very Much So*

Right now I feel relaxed



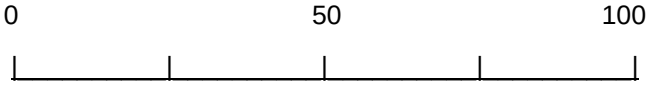
Not at all *Very Much So*

Right now I feel annoyed



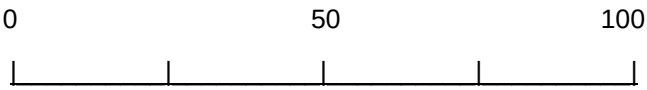
Not at all *Very Much So*

How likely do you think it is that _____ will happen again?



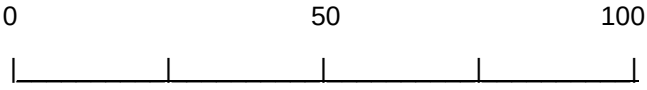
Not at all *Totally*

How able do you feel to do _____ again in the future?



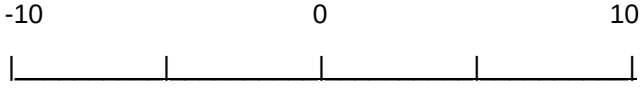
Not at all *Totally*

How enjoyable would _____ be if you were to do it again?



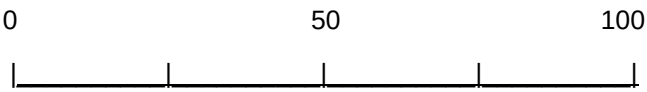
Not at all *Totally*

How pleasant was the memory?



Unpleasant *Pleasant*

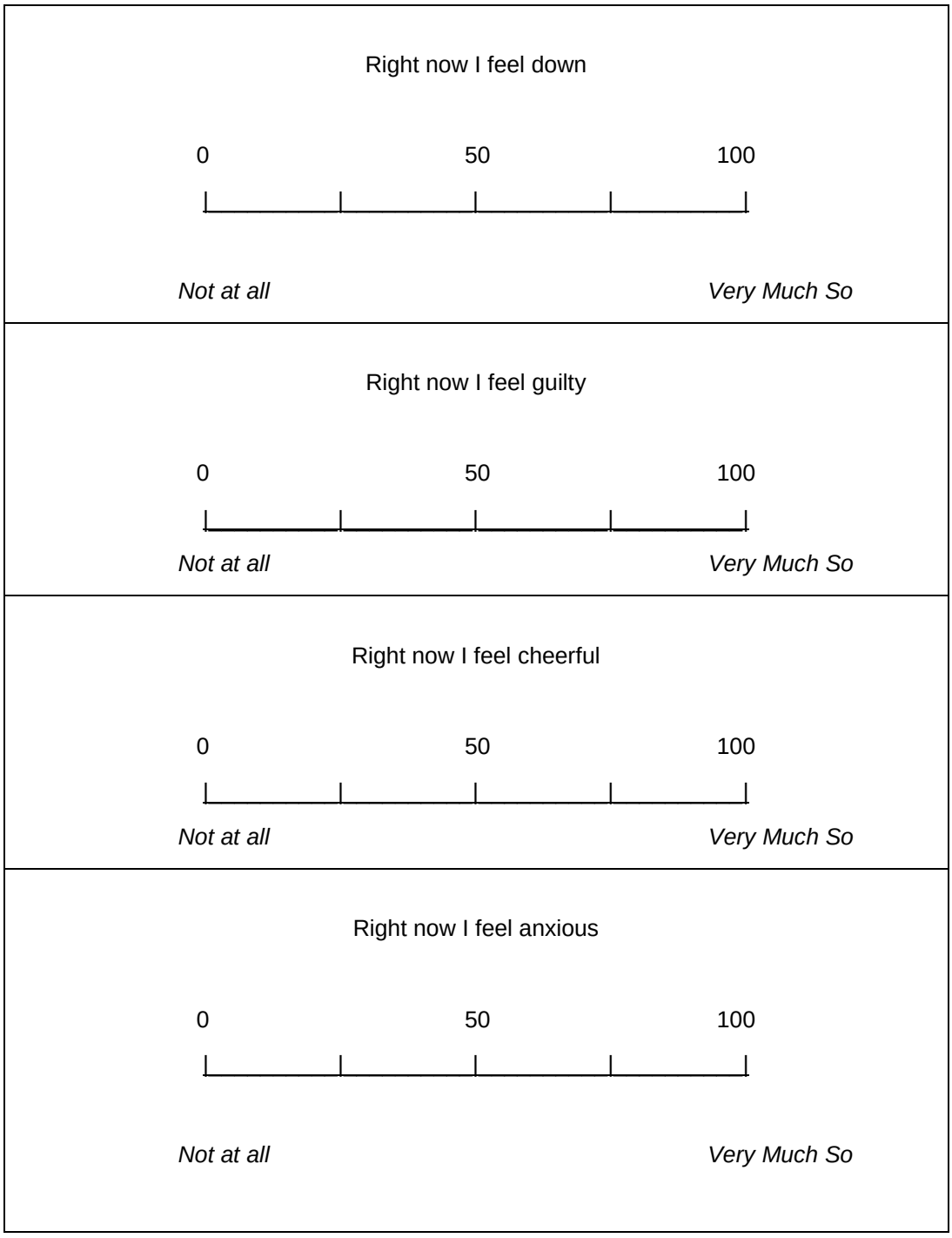
The memory felt real to me



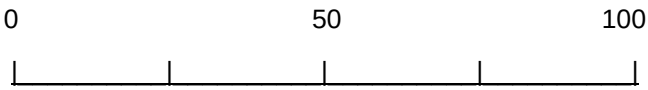
Not at all *Totally*

Memory 2 Pre-

Memory Keyword:

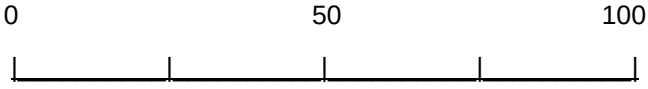


Right now I feel satisfied



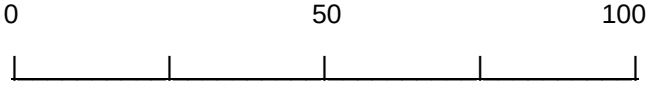
Not at all *Very Much So*

Right now I feel relaxed



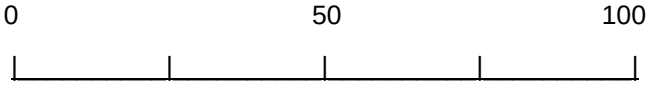
Not at all *Very Much So*

Right now I feel annoyed



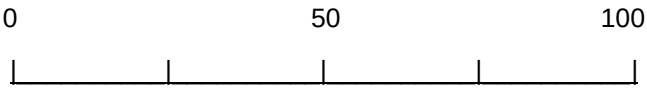
Not at all *Very Much So*

How likely do you think it is that _____ will happen again?



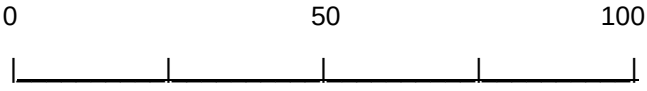
Not at all *Totally*

How able do you feel to do _____ again in the future?



Not at all *Totally*

How enjoyable would _____ be if you were to do it again?

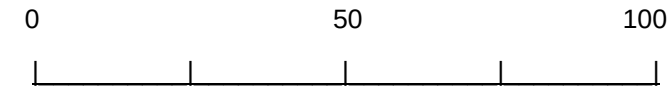


Not at all *Totally*

Memory 2 Post-

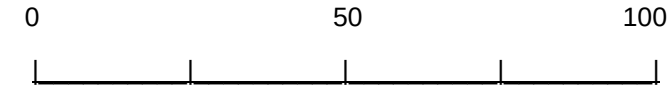
Memory Keyword:

Right now I feel down



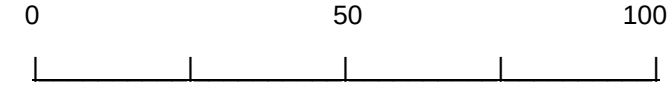
Not at all *Very Much So*

Right now I feel guilty



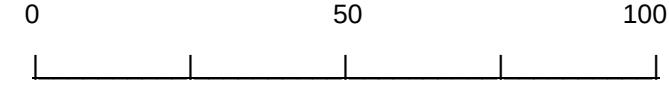
Not at all *Very Much So*

Right now I feel cheerful



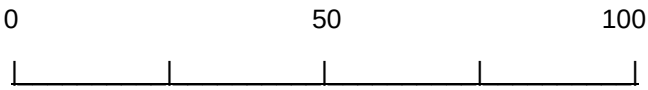
Not at all *Very Much So*

Right now I feel anxious



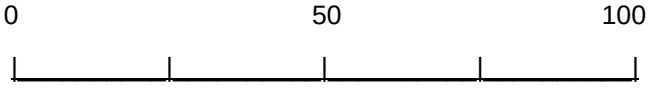
Not at all *Very Much So*

Right now I feel satisfied



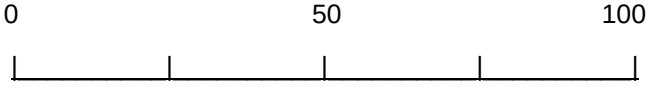
Not at all *Very Much So*

Right now I feel relaxed



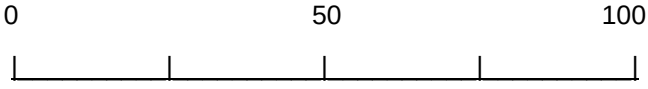
Not at all *Very Much So*

Right now I feel annoyed



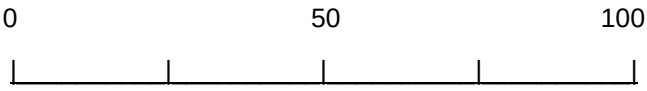
Not at all *Very Much So*

How likely do you think it is that _____ will happen again?



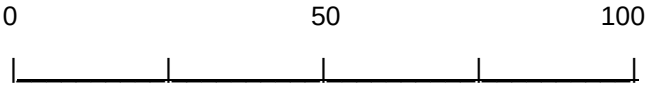
Not at all *Totally*

How able do you feel to do _____ again in the future?



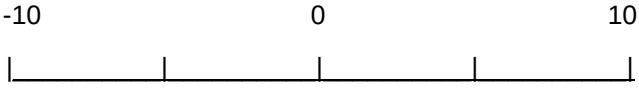
Not at all *Totally*

How enjoyable would _____ be if you were to do it again?



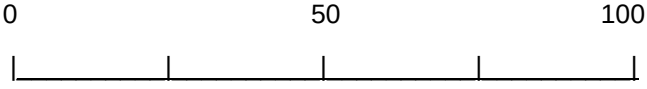
Not at all *Totally*

How pleasant was the memory?



Unpleasant *Pleasant*

The memory felt real to me



Not at all *Totally*

Memory Intervention Feedback Questionnaire

Please complete the questions below which will ask you about your experience of the intervention. Please be honest and give us any ideas you think may benefit people who take part in something similar in the future.

1. The session was helpful

0 50 100

Not at all *Very Much So*

2. The session was easy to take part in

0 50 100

Not at all *Very Much So*

3. I learned something from the session

0 50 100

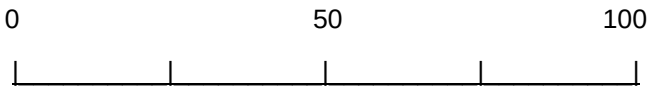
Not at all *Very Much So*

4. The session was relevant to my difficulties

0 50 100

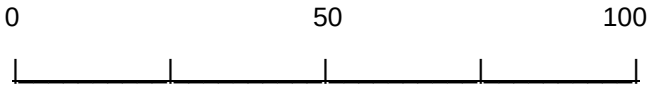
Not at all *Very Much S*

5. I would recommend the session to others experiencing similar difficulties



Not at all *Very Much So*

6. I would take part in something similar in the future



Not at all *Very Much So*

7. What was most helpful about the session?

_____
_____
_____
_____

8. What was least helpful about the session?

_____
_____
_____
_____

9. Will you continue using anything from the session in the future?

_____
_____
_____
_____

10. What would you change about the session?

_____
_____
_____
_____

11. Anything else you would like to add?

_____
_____
_____
_____